Christmas Buying Issue

CONSUMER REPORTS

NOVEMBER 1965 • NO ADVERTISING • 50c

Permanent-Press Shirts
Dishwashers
Miniature Radios
Chemistry Sets
Kitchen Blenders
Slide Projectors
Attaché Cases
Boat Speedometers
One-Cup Coffee Makers
New Low-Cost Polaroid
Family Planning Clock

Plus 3 special gift features

CU's annual "best buy" selection

A new assortment from museums

What to buy for car owners

Books for Christmas Giving

The Intelligent Buyer's Guide to Sellers

"This volume is the product of a highly literate person who set for himself the task of dealing, not with the surface manifestations of our boisterous salesmanship, but rather with the basic nature of these sales pressures and their historical origins. Taking the reader with him, Mr. Masters tracks the soul of the trader through time, through the words of the wise and the innocent, through the conscious and unconscious confessions of the greedy. He seeks to distill the essence of commercialism. And out of his search comes an engrossing account of the impact of our hard-sell culture upon a sensitive individual."—from the Introduction.

The Real Voice

This account of how the 1962 drug law was passed after a long fight led by the late Senator Estes Kefauver holds attention as a good detective story does. It goes point by point through the drug industry's lobbying and the effects of the thalidomide tragedy, and it tells what was won and lost in the end. Paperbound CU edition $1.50 to **Reports** *subscribers only. Hardcover Macmillan Co. edition, $4.95 in bookstores.*

Movies for TV

This unique paperbound handbook contains vital information on 17 years (1947-63) of movies you may see on TV—titles; stars; year of first listing; how CU's panel of moviegoers rated them; how critics reviewed them. 4450 ratings; 50¢.

To order, use coupon on page 573

READER REPORTS

LETTERS FROM CU'S READERS

Odd weights

Dear CU: For the champion of odd sizes, I nominate the "medium size" *Bromo-Seltzer*, which contains 1$\frac{9}{32}$ ounces!

DEMING, N.M. L.M., Jr.

Not as odd, perhaps, but just as crazy is another reader's contender: a can of *White House Apple Sauce* labeled "net weight 1 lb. ½ oz."

More car double-dealers

Dear CU: Here is an addition to your list of shady car-selling practices (CONSUMER REPORTS, May 1965). Two years ago we were in the market for a new car. We planned to finance it through our bank, so all we needed from the dealer was an agreement on price and trade-in. The dealer asked for a $100 deposit before he would order the car, and we innocently gave it to him. The next day he called to say that he couldn't sell the car for the price the salesman had quoted to us; he raised the price by $600. Of course, we asked for the return of our deposit and it turned out to be "non-refundable." The dealer had already taken the check to the bank, although he had earlier promised that he would hold the check until the car was delivered. My husband went down and argued for quite some time before our money was returned.

About two weeks later, I was at the corner grocery store. The checker made several mistakes at the cash register. Finally, she apologized and said that she was very upset. She had made a $100 deposit on a new car, and then the dealer had raised the price and refused to return the deposit. I asked the obvious question: which dealer? It wasn't the same one.

RICHMOND, CALIF. P.H.D.

Conflicting advice—all good

Dear CU: Recently I received a copy of "The Medicine Show," by the editors of CONSUMER REPORTS. It says that the safest thing for fainting is to place the victim flat on his back until he recovers. This year's Buying Guide Issue says that the safest thing for fainting is to place the victim flat on his stomach until he recovers. The American Red Cross First Aid Text book says to place the victim in a sitting position and have his head bent between his knees as much as possible. If a person is handled as much as this—first put him on his back; then turn him over and put him on his stomach; then sit him up and lower his head between his knees—I am sure he would arouse himself from his faint and fight back in self-defense. What do you think?

TULSA, OKLA. A.B.C

We think his "benefactor" might faint from exhaustion and need treatment himself. Seriously, there are many ways of treating fainting, and any of these three would serve. The important thing is to get blood flowing to the head.

Iodine limit

Dear CU: A "Docket" entry on *Sea-Kelp-Ettes* tablets (CONSUMER REPORTS, September 1965) states that FDA's maximum intake rate for iodine is .015 milligrams per day. I believe the intake rate for iodine is 0.15 milligrams per day, as set by the FDA.

BETHLEHEM, PA. R.J.P.

That it is; a typo slipped through.

It isn't needed

Dear CU: Your organization is actively engaged in subjects in which Federal legislation is of great significance (packaging, medical care, urban transportation, food and drug control, etc.). Thus a conscientious member of CU must on many occasions make his views, whether they favor CU's editorial position or oppose it, known to his Federal

CONTINUED ON PAGE 573

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THE CHRISTMAS BUYING ISSUE OF
CONSUMER REPORTS

NOVEMBER 1965 VOLUME 30 NUMBER 11

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Tests of built-in units included 14 de luxe and four economy models; five are check-rated

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The 15 models tested are for power boats; they were rated for such factors as accuracy and installation ease

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The purposes of Consumers Union, as stated in its charter, are to provide for consumers information and counsel relating to consumer goods and services . . . to give information and assistance on all matters relating to the expenditure of the family income . . . to initiate and to cooperate with individual and group efforts seeking to create and maintain decent living standards.

Any subscriber may become a member of Consumers Union by so indicating at the time he subscribes to the REPORTS or on written application at any time. Any subscriber becomes a member also by voting in the annual election of CU's Directors; ballots are mailed to all subscribers. Membership entails no financial or other obligation. Address all letters to Consumers Union, Mount Vernon, New York, 10550. Please do not ask for special tests or for product information beyond what appears in CONSUMER REPORTS.

CU's Ratings of brands or models for the most part are given in order of their estimated overall quality or performance, without regard to price. "Best Buy" Ratings are accorded to Acceptable products which, because of relatively low price, should give more quality per dollar than other Acceptable products. Brands or models are check-rated (✓) when the test samples prove to be of high overall quality and significantly superior to those of other brands or models tested. Several brands or models within a project may be check-rated (✓) when, in CU's judgment, they are about equal in quality or so little different that price, appearance, or other such considerations may reasonably determine the consumer's choice. All Ratings should be applied only to the specific brands or models actually reported on.

Samples of products tested are bought on the open market by CU's shoppers. So long as quality varies within brands, and products change behind their names, no test results can be infallible. What CU's Ratings offer is comparative buying information, the use of which, CU believes, will enormously increase the consumer's chances of getting his money's worth. Ratings are based on laboratory tests, controlled use-tests, expert opinion or experience, or a combination of these factors. It is CU's pledge that any opinions entering into its Ratings of products shall be as free of bias as it is possible to make them.

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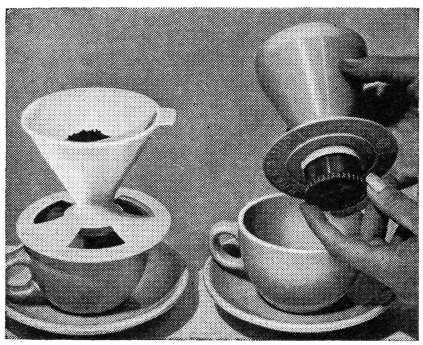
Once Over

A dollar gift for a bachelor—maybe

The one-cup coffee-maker is an old stand-by in France and Italy, but now American manufacturers have also come to the aid of the "solitary drinker" who doesn't like instant coffee. CU tested two of these devices that brew regular coffee one cup at a time. They are the *Brew-a-Cup* (Whitecliff Laboratories, Inc., P.O. Box C, Los Altos, Calif., $1 postpaid) and the *Coffee-Cone* (David Douglas & Co., Inc., P.O. Box 600, Manitowoc, Wis., 98¢ postpaid, including 12 filter papers; additional filters, $1 per 100). Besides being procurable by mail from its manufacturer, each product can also be found in stores, where it sells for around $1.

The *Brew-a-Cup* promises the "full, rich flavor of freshly brewed coffee"; the *Coffee-Cone* simply offers "great tasting" brew. Each is made of plastic (unlike the European counterparts, which are usually made of metal) and is designed to perch atop a coffee cup or mug; ground coffee is put into the device, and boiling water is poured over it. In the *Coffee-Cone*, the grind is placed in a disposable filter-paper insert; in the *Brew-a-Cup*, it goes into a slotted plastic basket, which locks into the bottom of the unit.



The Brew-a-Cup (at right), showing the removable coffee basket, and the Coffee-Cone

Because these devices make such a small amount of coffee at a time, CU found it difficult to get consistent results in laboratory testing to see whether the coffee produced would meet the standards of the Coffee Brewing Institute (which we use in evaluating larger coffee-makers). So we based our judgment of the one-cup brewers primarily on home-use tests by a panel of 15 staff members.

With the *Coffee-Cone*, which calls for drip grind, most of the use testers were able to make coffee they judged at least good, but generally only after some experimenting. In most instances they ended up using more coffee than the instructions call for, and found it necessary to pour the water slowly and in careful accordance with the directions so as to steep all the grounds.

The *Brew-a-Cup* didn't fare as well. Only a few panelists liked its regular-grind brew; others judged it to be marginal, and about half of the panel found it weak and unpalatable. Those who found the coffee too weak were unable to increase its strength by using more coffee, since the basket will hold only so much. However, when the instructions calling for regular grind were ignored and drip grind was used, coffee strong enough to satisfy most coffee drinkers was produced. But the water took more than five minutes to run through, and by then the coffee was cool. (The heat loss can be reduced to some extent by preheating the cup and by using briskly boiling water.)

Both models were found quite convenient to clean. The *Coffee-Cone* may have a slight edge in convenience, for its filter paper, holding the used grounds, can be simply lifted out and discarded.

Whether or not you (or the bachelor on your gift list) will find either device a worthwhile buy depends on how much is expected of it. You aren't likely to get a really hot cup of rich-flavored coffee with either. Yet, if you intend making a single cup often, it might be worth experimenting with one of these units. We believe more people will be able to approximate their ideal cup of coffee with the *Coffee-Cone*. However, if you prefer your coffee on the blond side, either model may do.

Ghost of Christmas yet to come?

Defining the city-state, Aristotle said that "there must be, both in households and families, a sharing of the good life, in a form at once complete and self-sufficient." Neo-Aristotelian product planners at RCA would, it seems, take this ancient wisdom to mean: The family that's entertained together is chained together.

Or so, at least, one might gather from the RCA boys' glimpse into the future to which the home-entertainment

appliance trade was treated last summer. There, just beyond the horizon, was the solution to the problem of family disintegration: a four-way "personalized" electronic appliance. "This design does not separate the family," an RCA official said, "but allows each member to enjoy a particular medium . . . without disturbing others."

Mounted in a chrome-trimmed rosewood cabinet were a television set, a radio, a stereo phonograph, and a tape recorder. Through these media, four individuals who are, presumably, members of one family or household could be entertained separately but simultaneously from individual earphones. ("Mommy, stop Johnny from watching my TV program while he's listening to the Beatles!") An RCA vice president tantalizingly estimated that the whole rig might some day (not yet specified) be on the market at "around $700."

RCA's name for this prototype of the good life yet to come is *Dimensia IV*. Like crazy, man.

Polaroid's Swinger—it does and it doesn't

Numerous members of the younger set may be asking Santa for the newest *Polaroid* camera, the *Swinger Model 20*, if the Polaroid Corp.'s big youth-oriented advertising campaign pays off. The *Swinger* (it swings from the wrist on a strap) is small enough (4½x6x5 inches) and light enough (about 1¼ pounds) to be toted around as easily as, say, a small portable radio. So the size is right, and the price may be, too—it lists for $19.95. But how well does it work?

The *Swinger* is a fixed-focus, single-shutter-speed camera with a built-in flashgun (which uses AG-1 bulbs) and a unique exposure meter coupled to its aperture (lens opening) control. Like many current box cameras, it has a molded-plastic lens and, like box cameras of old, nothing to prevent double exposure. In short, just about the only really distinctive feature of the *Swinger*, aside from its exposure control system, is that, like other *Polaroid* models, it develops its own prints. But the pictures are relatively small (2⅛x 2⅞ inches plus a white border), and at present they can be made only from the easily loaded drop-in rolls of *Type 20* black-and-white film (there is no color film available for the *Swinger*). An eight-exposure roll lists at $1.99—that's about 25¢ a print.

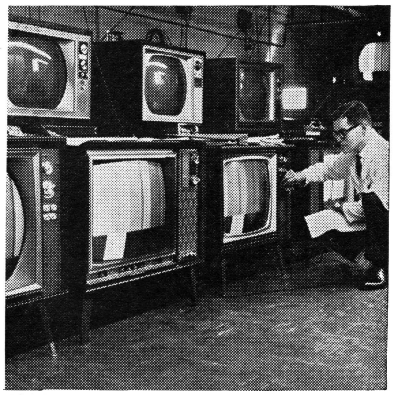
Here's how you get the print. After taking the picture, you press a button and pull out the film until it stops. You wait 10 to 15 seconds, then tear it off, peel the developed print from the processing sandwich, straighten it, and coat it with lacquer, using the swab that comes with the film. But the film tab, being short and somewhat slippery, was found difficult to grip firmly. If one's fingers slipped and the film was not pulled from the camera smoothly, the print would not develop uniformly. And even when the film *was* pulled out smoothly, CU found, the prints sometimes had white areas in the corners.

In optical performance the *Swinger* showed some shortcomings, too, and these were more serious than the faults of some low-priced box cameras CU has tested in the past. Prints made with CU's samples exhibited very noticeable "pincushion" distortion—that is, an outward curvature of straight lines near the edges of the print. Moreover, the prints were noticeably lacking in sharpness toward the corners, even when the exposures were made at the smaller aperture settings that are called for by bright sunlight.

The camera has a lens aperture range of from f/17 to f/96 and a shutter speed of 1/200 second. The combination facilitates picture-taking when the light is pretty good, but, despite the high speed of the film, you must use the built-in flash to get good pictures indoors, or even outdoors on heavily overcast days. The fast shutter speed does, however, make it possible to freeze many moving subjects and to prevent a somewhat shaky hand holding the camera from blurring the photograph. And the small apertures of the fixed-focus lens permit reasonably sharp prints to be made from as close as two feet or so in bright light or about four feet in dimmer light.

The *Swinger's* exposure control system is operated by squeezing and turning a knob until the word NO, seen through a window under the viewfinder, becomes YES; if YES can't be

Work IN PROGRESS



IN JANUARY: Our first full Ratings report on color TV sets

SCHEDULED FOR PUBLICATION IN EARLY 1966 ISSUES

HEARING AIDS
A broad medical and marketing discussion, along with Ratings of nearly 40 models, some low-priced

FULL-SIZED SEDANS
Four popular and low-priced cars (Ford, Chevy, Plymouth, Pontiac) are being road-tested for our first report on the 1966 models

SEWING MACHINES
Portable units priced under $150, both straight-stitch and zigzag, are included in the project

BATHROOM SCALES
Test samples include "self-zeroing," stand-up, and beam-balance scales, as well as more conventional models

SHELL EGGS
A depth study in two cities will check labels against quality of eggs from several kinds of retail sources

ELECTRIC TOOLS
Along with regular ¼-inch drills, portable power tools that require no grounding are being tested

ALSO SCHEDULED FOR FUTURE PUBLICATION

Canned salmon
Toasters
Fertilizers
Food-waste disposers
Raincoats
Small-screen TV sets
Pillows
Air thermometers
Low-cost loudspeakers

Quote

WITHOUT COMMENT

"The receiving, pasting, saving and redeeming of stamps for gifts contains a satisfying pattern of human behavior that is as basic in its own right as the need to eat the food that provides the stamps in modern day merchandising."—KING KORN KOMMENTS, *house organ of the distributor of King Korn trading stamps.*

"Supermarkets [in Pittsburgh] continue to bang away at low, low prices in ads but the customers are paying more for food now than they did a year ago. Prices probably will go up still more this fall when the 132,000 Pittsburgh district steelworkers get the pay hike expected from current negotiations. Although he concedes that . . . all supermarket operators will [then] hike prices, one executive, determined to retain his low-price image to the last minute, pointed out that when that happens he'll have the lowest of the new, higher prices."—SUPERMARKET NEWS.

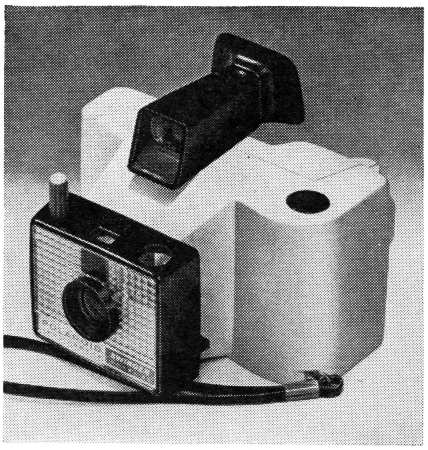
"Studebaker has made sharp changes in both exterior and interior styling of its 1966 models, but has stayed well within the framework of its previously announced policy of continuity of design to eliminate the penalty of needless obsolescence for its owners."—*From a press release issued by the Studebaker Corp.'s Public Relations Department.*

". . . cocktail bottlers haven't yet figured out how to win over those drinkers who get special satisfaction and enjoyment out of mixing their own drinks. 'The biggest hurdle in selling bottled cocktails is that people just aren't lazy enough yet,' says [Glenmore Distilleries Co.'s President Frank B.] Thompson."—WALL STREET JOURNAL.

"The influence of the Washington [auto safety] hearings . . . will be felt in automobile advertising. Not that the companies will advertise that they have finally built safer cars. . . . [If] the ads should say something like, 'Our 1966 cars are the safest vehicles on the road today,' the implication would be that other cars are not safe. This would not set well with the millions of motorists who purchased cars in 1965 and before, particularly those who still have payments to make."—ADVERTISING AGE.

Once Over CONTINUED

made to appear, there probably isn't enough light to get a good picture. Turning the control knob balances surrounding light against the light from a tiny bulb powered by two size-AA batteries inside the camera, and in so doing also sets the lens aperture for a proper exposure. The life of the bulb used in the control system is estimated by the manufacturer to be "over 10,000 pictures," but when the bulb does fail, the camera must go to a *Polaroid* repair station before it can be used again.



Battery life is claimed to be "a minimum of one year," but the actual life will depend on how much you use the flashgun, which also is powered by the batteries. The batteries are easily replaced—and should be as soon as badly underexposed pictures tell you they have begun to fail. Once they or the bulb has failed, the camera can be used only with its flashgun, since, having no aperture markings, the camera cannot then be set for a correct exposure.

All things considered, CU rates the *Swinger*'s performance fair-to-poor. However, it will probably satisfy anyone who is not especially fussy about print quality and wants "instant prints" at a relatively low price.

A family planning clock

The latest addition to clocks that switch on the radio, start the coffeemaker, or perform some other service is a model advertised as an aid in family planning. Intrigued by this claim, CU bought the clock to see what made it tick.

A by-product of the well-known rhythm method of birth control, the *Lady 13021* (Sessions Clock Co., Forestville, Conn., $19.95) is designed to show the user at a glance whether a given day is a probable "safe" day or a probable day of fertility. Before she can rely on the rhythm method, a woman must keep records over a period of preferably at least 12 menstrual cycles to determine the length of her longest and shortest cycles. Then a simple calculation enables her to mark off on the calendar the period of each cycle during which pregnancy is likely to occur. This method of birth control is fully described in "The Consumers Union Report on Family Planning."

The *Lady 13021* serves the same function as the marked calendar. First, its user consults an accompanying table that gives her the information she needs to set the clock according to the duration of her longest and shortest cycles. Then, in a three-step operation, she sets the clock by turning a knob in back.

Once the clock has been set, a number in a little window in its face advances by one each day, a black background indicating a "safe" day, a red one a fertile day. Thereafter the user simply resets the clock to the numeral 1 on the first day of each menstrual period.

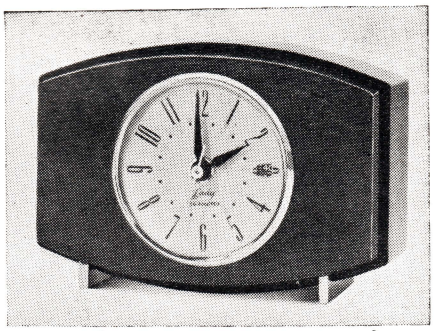
CU had six women try following the instructions to see whether they had any difficulty with them and asked the women how they reacted to the whole idea. All were able to set the clock correctly, though sometimes a second try was necessary, owing to an error caught by the juror herself. But almost all complained that the knob was very hard to turn during the first of the three steps required for setting the clock. They also felt that, even though simplified (oversimplified, we would say) instructions appear on the bottom of the clock, the instruction book can't be dispensed with, for it contains the table on which the settings must be based.

This table, by the way, gives no instructions for women whose shortest cycle is less than 22 days, for those

whose longest is more than 40 days, or for those whose cycles differ by more than eight days.

The clock, therefore, cannot be used by everyone. Indeed, as the "Report on Family Planning" points out, the rhythm method is generally not recommended for any woman whose longest cycle exceeds her shortest by more than 10 days. In any case, CU's jurors felt that, even for those who could use the clock, its special feature offered little advantage over the calendar-marking system. Moreover, as one juror noted, the clock's fertility setting might be unwittingly altered by the user's turning the wrong knob when setting the clock's alarm.

We are inclined to think that a calendar might be preferable to the clock for still another reason. A change in the pattern of a woman's menstrual cycles is not uncommon, and if such a



change occurs, the clock must be reset. But some women using the clock might not keep track of their cycles accurately.

CU found the *Lady 13021* relatively quiet in operation (at least during the test period) but equipped with an alarm that very heavy sleepers might consider too soft. Also, the *Lady* costs a lot more than many conventional electric alarm clocks.

STAFF OPENINGS AT CU

ENGINEERS. During the last year or so, CU has been working toward a substantial increase in its Technical Department program, which in years to come should improve service to subscribers. The staff complement is not yet complete, and we would like more engineers to submit applications.

A job at CU offers several special advantages (aside from salaries that are competitive with industry's). The laboratories are in suburban Mount Vernon, only a half hour from New York's Grand Central Station. The technical man at CU is important. His opinions count. He works on a variety of projects, each of which offers challenging problems. The results of his work are published regularly in CONSUMER REPORTS, where they are used by nearly a million families.

If you have a degree in electrical or mechanical engineering and at least three years' experience, and would like to join CU's staff, please send a summary of your education, experience, and salary requirements to the Technical Director, Consumers Union, Mount Vernon, N.Y. 10550.

MEDICAL ADVISER. There is also an opening at CU for a properly qualified physician. The doctor who has been our chief medical adviser since CU's beginning wishes to retire from the post. To succeed him, we need a young M.D. with background and interest in public health and in medical economics from the patient's viewpoint. He (or she) must have a probing, perceptive mind and be able to devote at least half his time to working with us (including one day a week at CU's headquarters in Mount Vernon, N.Y.). The ability to write for a general audience would be useful.

Our medical adviser participates in the planning and preparation of reports on health and medical subjects for CONSUMER REPORTS, assists in obtaining qualified contributors, and reviews manuscripts and proofs. If you are qualified and wish to learn more about this opportunity, please send full particulars about your professional training, special interests, and present affiliations to the Editorial Director, Consumers Union, Mount Vernon, N.Y. 10550.

Follow-up

TELEPHONE SOLICITORS. The California Public Utilities Commission turned down proposals aimed at protecting people from unwanted sales and advertising phone calls (CONSUMER REPORTS, July 1965). It said Morey W. McDaniel's plan for an asterisk in the phone book before the names of those people not welcoming such calls would be ineffective and unenforceable without further laws. It also refused his requests that subscribers be allowed to buy an extra line in the phone book saying "No telephone soliciting" and that the phone company get permission from subscribers before listing their names in street directories used by canvassers. Pacific Telephone & Telegraph Co. argued that people can deal with unwanted calls by either hanging up or getting an unlisted number.

CANDIDATE WITHDRAWS. In the ballot count for the election of directors for CU's Board, one of the candidates is noted in the list on page 569 as having withdrawn from the contest after the ballots had been sent out. His explanatory letter to CU's president follows.

Dear Dr. Warne:

It is with deep regret that I must withdraw my name as a possible member of the Board of Directors of Consumers Union even as the ballots are being counted. It is an honor to be even considered by an organization I have been proud to serve and have recommended to thousands of others over the past 25 years.

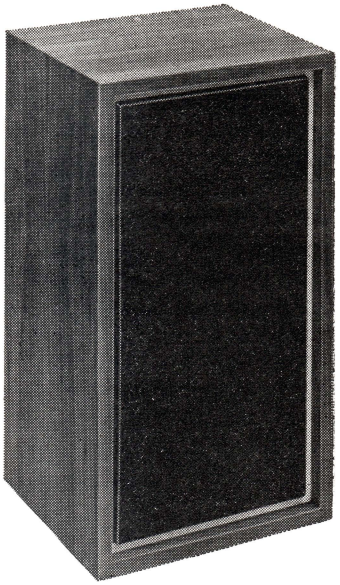
I have accepted an assignment to do a marketing study of northern Nigeria for the University of Pittsburgh under the auspices of the U.S. Agency for International Development, which will keep me out of the United States for most of the next two years. Thus, I feel, I could not do justice to Consumers Union if elected to the Board. You should know, however, that you, the Board of Directors, and Consumers Union have my complete, unequivocal support even though the distance [between us] in time and space will be substantially greater than in the past. . . .

Respectfully,
Henry L. Munn

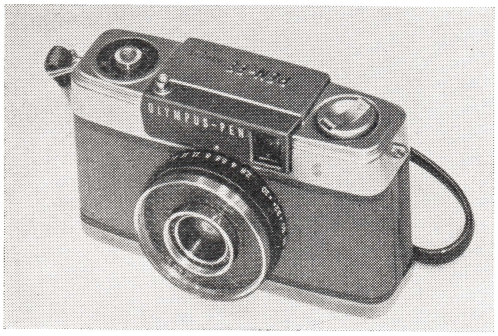
"Best Buy" Gifts

As is our happy custom at this time of the year, CU has devoted most of this issue to new test reports on products that might make suitable gifts. In addition, on this and the following two pages, we present other gift suggestions selected from test reports published during the last 12 months. All of these products are "best buys," not necessarily in the special sense the term conveys in CU's Ratings, but in the sense that they ranked high in our tests, and should make welcome gifts if chosen to fit the recipient's needs and tastes.

All the products suggested here were current at press time. They then ranged in list price from $1 to about $100, but most were under $50. Discounts may be available for many of them.



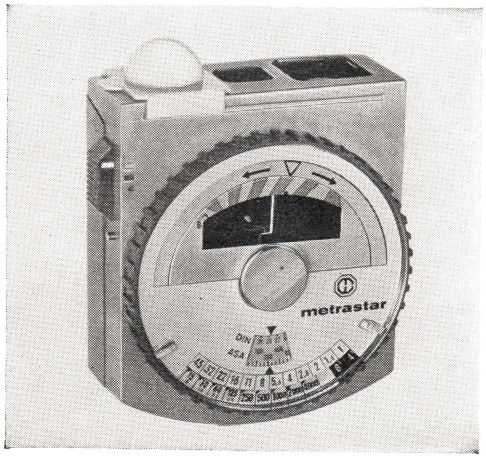
There were two Best Buys among nine check-rated compact speakers. This is the ADC 303A ($95); the other is the AR2x ($102). Of course, a stereo system requires two of either model



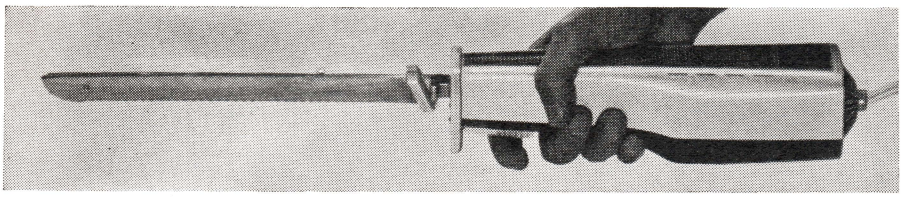
Among single-frame 35mm cameras tested, the Olympus-Pen-EE ($49.95) was best of the autoexposure, fixed-focus models

Current price of the check-rated Best Buy Sunbeam AP11A, a "10-cup" coffee-maker, is $19.50

Skil 501, because its speed is variable, might be a good choice for a man who puts a drill to many uses. For Christmas, its price ($29.95) also includes 12 accessories. Or consider a single-speed drill that needs no grounding; the Black and Decker 880 Type B ($33) was judged high in overall quality

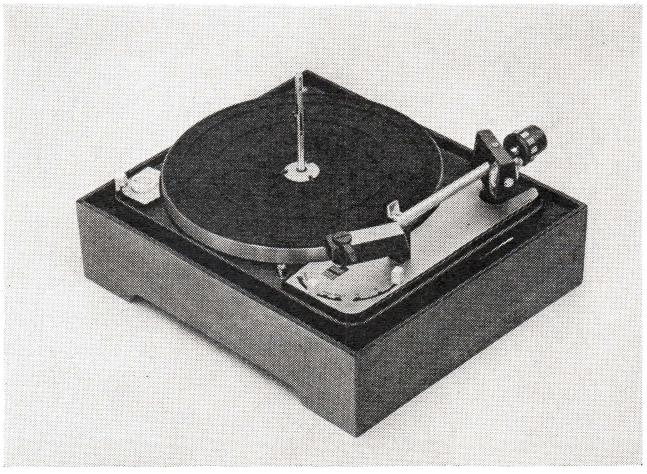


Photographers will appreciate the sensitivity and accuracy demonstrated by the Metrastar exposure meter, a compact and convenient unit that measures either reflected or incident light. Its price, a relatively expensive $66, includes a carrying case and a neck chain



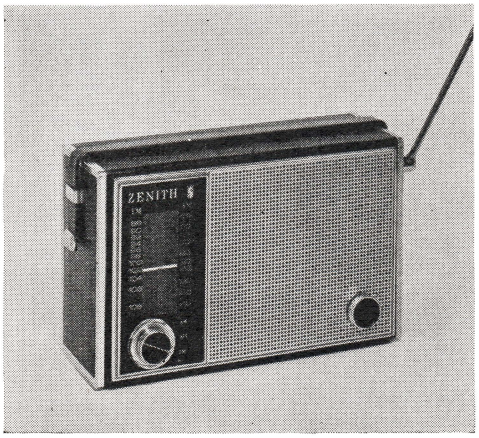
Least expensive of the top-rated group of electric slicing knives was the General Electric EK-4, and its price is down almost $4 to $18.98

The only Best Buy monophonic tape recorder still available is the Lafayette RK 137A, $89.95. Though this instrument may not please an audio perfectionist, it is a good machine for all around use and, when connected into a good audio system, it can reproduce music well

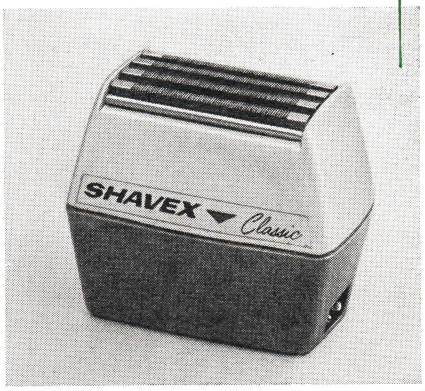


In the check-rated Dual 1009 ($99.50), CU found for the first time a record changer that performed as well as the best single-play machines. It can accommodate 10 records, is unusually quiet in operation, and has a speed adjustment control. Wooden base, $6.95 extra

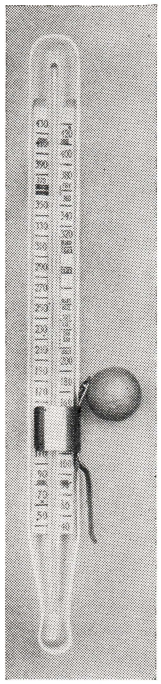
Three check-rated Best Buys from the melamine ware project are still current. Sears Harmony House Maple Melody is shown; it is $17.94 plus shipping for an eight-setting, 45-piece set. The others are Boontonware Somerset Bachelor Button and Oneida Homemaker Blue Hawaii, at $19.95 and $24.95 per 45-piece set, respectively

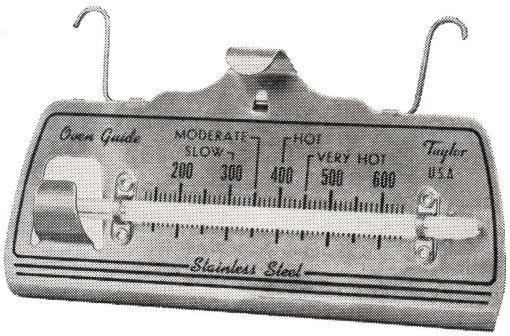


There were two check-rated portable FM/AM radios: the Zenith Royal 820 (shown), at $79.95, and the Philco NT-913BK, at $77.45



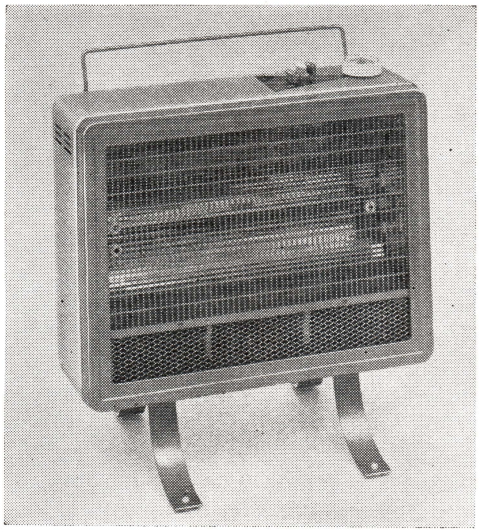
Cord-type Shavex Classic 3250, $19.95, pleased most users; its guarantee of satisfaction or refund was honored with no questions asked



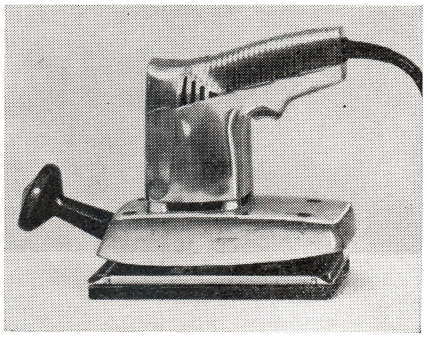


Cooking aids are often welcome. Among candy and deep-frying thermometers, the Ohio 6980 (left) was a Best Buy at $1; the Taylor 5921 ($2.98) was the top-ranking oven thermometer

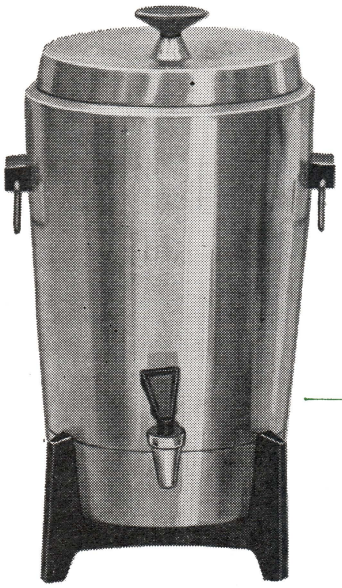
Least expensive of the best tennis balls was the Tretorn, sold under a number of labels. It is a Best Buy at four for $3 or less. The distributors, and their prices for four, are R. H. Macy & Co. (Supre-Macy Tretorn), $2.49; Abercrombie and Fitch Co., $2.85; Bancroft Sporting Goods Co. (Bancroft Tretorn), $3.50; and the Anscor Trading Co., $3.50



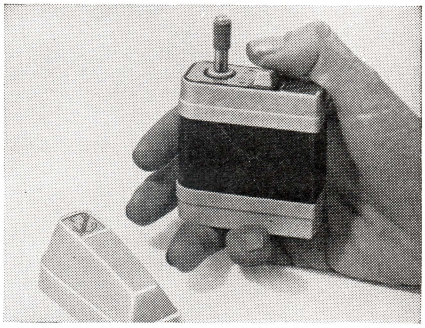
Two check-rated portable upright heaters were of the combination radiant-convection type: the Titan 148 (shown) and the Markel 108T. Each is $29.95



Best Buy finishing sanders still current: Stanley H-37, $25.20, pictured; the Wizard 2HC6002, $22.50; Shopmate 1800, $24.95

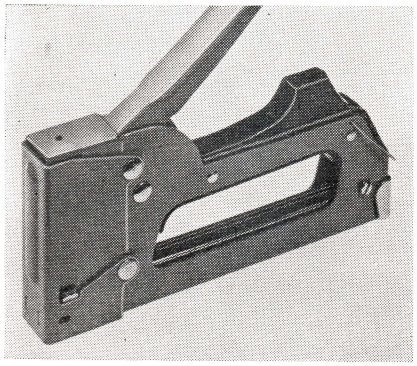


This West Bend 7210E ($29.95) is one of two Best Buy coffee urns. Another is the Sunbeam AP45, $26.25. Both brew almost 30 cups

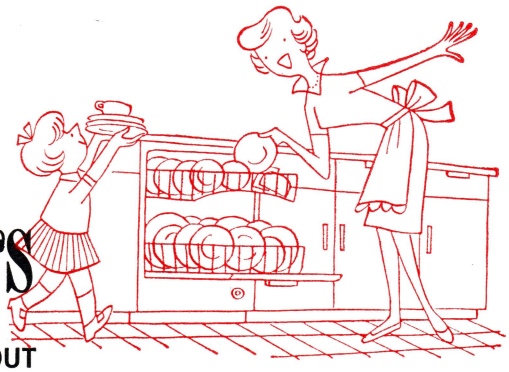


Most testers said they would like to get the battery Manicurette ($5.95) as a gift

A fly rod may please the angler on your list. The versatile Garcia Conolon 2638T ($16), an 8½-foot rod, is a good choice



Best Buy Arrow T-55 staple gun ($8.95) did heavy jobs and many light jobs well



Dishwashers

THE PROBLEM OF REDEPOSITED GRIT WAS JUST ABOUT SOLVED BY THE 18 DE LUXE AND ECONOMY BUILT-INS TESTED, AND PERFORMANCE IN GENERAL WAS IMPROVED

Among household appliances, the automatic dishwasher is something of an evolutionary maverick. Instead of improving gradually or by unaccountable fits and starts, its design has undergone a decided change for the better in just a few years—since the introduction of the 1959 *Whirlpool*, in fact, which seems to have been a turning point in this appliance's development.

Thus, the general level of dishwasher performance today is quite high, and the differences among models in washing ability have narrowed. Among the 18 built-in dishwashers tested this time, even "average" dishwashing performance is better than it used to be, and machines noted as having "below average" performance still did quite well.

One of the reasons for this cheering news appears to be that, for scrubbing, all use some form of the revolving wash-arm spray mechanism, which provides superior water distribution and eliminates the need for rigid patterns of dish placement in the racks.

Bed of nails

To take advantage of this greater flexibility in loading, most models have based their rack design on the "bed of nails" pattern—rows of rounded, plastic-coated spikes that permit random placement of odd as well as ordinary sizes and shapes. This design generally increases capacity. Most racks are of the convenient roll-out variety, and most can be removed for access to interior walls and filters.

The old problem of redeposited grit on dishes has been all but eliminated by improved filtering and purging systems that rid the wash water and machine of the bulk of loosened soil. And a few more models than formerly have interior walls coated with porcelain, which is less likely to scratch and stain than the still occasionally encountered plastic finishes. Though porcelain can chip, it won't peel and expose the base metal to corrosion, a problem some of CU's readers have had with plastic. (Stainless steel, the best but most expensive lining material, is used only by the high-priced *Thermador* among the models tested.)

There are other important differences among current dishwashers. Even though they all do wash better than most of the models CU tested in 1959, five of those tested this year (the *Westinghouse*, both *KitchenAids*, and both *Whirlpools*) were clearly superior to the rest in overall quality, and these have been check-rated.

It bears mentioning, though, that if you decide to buy one of the economy models (two of which were among the top-ranking five), the chances are when you go shopping you'll be pressured to switch to a more de luxe machine. The practice of "trading up" customers is hardly uncommon among appliance salesmen. And in the case of dishwashers many sales-switch arguments might appear to make sense: more wash arms, more washing cycles, more automation, fan-drying, larger claimed capacity. But only some of these features proved their worth in CU's tests.

Back at the laboratory

To see what such special features and design variations had to offer, we bought the most de luxe model of each of 14 widely distributed brands, and included the economy models of the four best-selling brands for comparison. Our tests were limited to built-in undercounter dishwashers, which outsell all other types combined.

In our laboratory, the machines were given tough but realistic cleaning jobs. Dishes, glasses, and flatware were soiled with a wide variety of foods, including beef stew, mashed potatoes, spaghetti, fried-egg yolk, oatmeal, coffee, milk, fruit juices, and bread crumbs. A half-hour later, the dishes were given a light scraping, which removed only the bulk soil, and the glasses and cups were emptied of excess liquid. Then all the items were put into the machines to stand overnight before washing. Each load was eight place settings—a setting, as defined by the National Electrical Manufacturers Association (NEMA), consisting of a dinner plate, a salad plate, a sauce dish, a glass, a cup and saucer, and a knife, fork, salad fork, and two teaspoons.

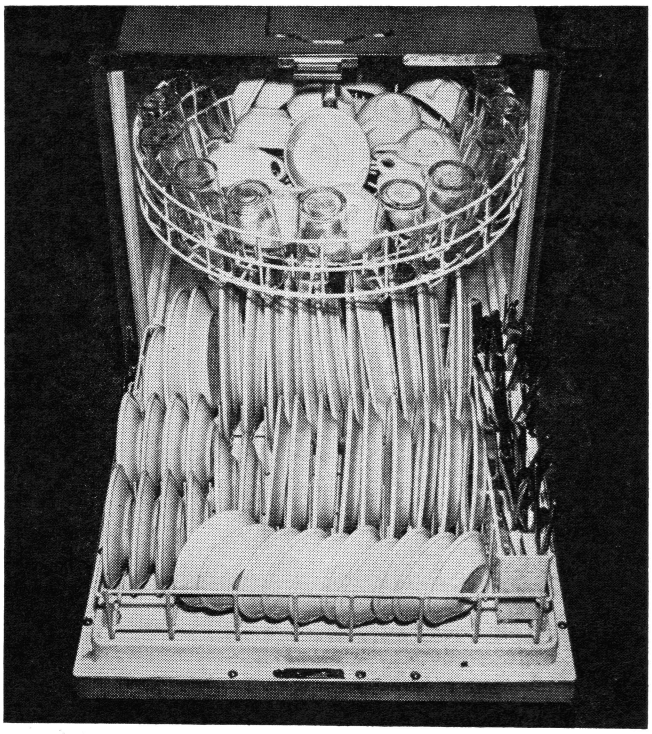
Each dishwasher was run at its maximum wash setting with an appropriate detergent concentration, at a water temperature of 150°—such conditions are within the range

recommended by every manufacturer. Eight different dishwasher detergents were used in a test sequence designed to disclose differences in machine performance. (These same tests provided data that will be consulted for a CU report on dishwasher detergents, planned for publication early next year.)

As soon as a machine completed its cycle, every item washed was examined first for completeness of drying and then, by sight and touch, for cleanliness. More than 15,000 such inspections were made. Water and power consumption as well as cycle times were measured. Potential hazards were looked for and judgments were made of machine capacity, ease of loading, rack removal, control operation, cleaning of filters, and noise of operation.

Performance: fact and fancy

The present method of wash-arm scrubbing forces hot water through perforations in a revolving horizontal arm, sending a strong spray in all directions to dissolve the detergent and attack the soil on the dishes. Most of the machines, however, have added some sort of multiple-level action to the basic wash-arm design. Some have one double-decker assembly. Some have two or more completely separate wash arms. Some combine one wash arm with a telescoping "tower" or with a horizontal spray tube. And in two (*Tappan* and the similar *O'Keefe & Merritt*), the separate wash arms reverse direction several times during the cycle in an effort to get at any partially masked items.



Circular racks rotate for easier loading and unloading, but this minor convenience sacrifices some corner space, accounting in part for slightly below-average capacity in models so designed

Impressive though some of these arrangements appear to be, CU found that elaborate design is no guarantee of superior washing performance. Three of the five check-rated models—both *KitchenAids* and the economy model *Whirlpool SLU 70-3*—have the basic single-arm design. They did just about as good a job as the check-rated *Westinghouse* and de luxe *Whirlpool SLU 90-4*, with their two wash arms. In contrast, the de luxe *General Electric SD-400A*, with one main wash arm, two auxiliary arms, and a spray tower, didn't give as good an overall performance as a number of single-arm machines. In fact, although one of its auxiliary arms was intended specifically for the washing of flatware, it was judged to clean flatware no better than did GE's economy model with its single arm.

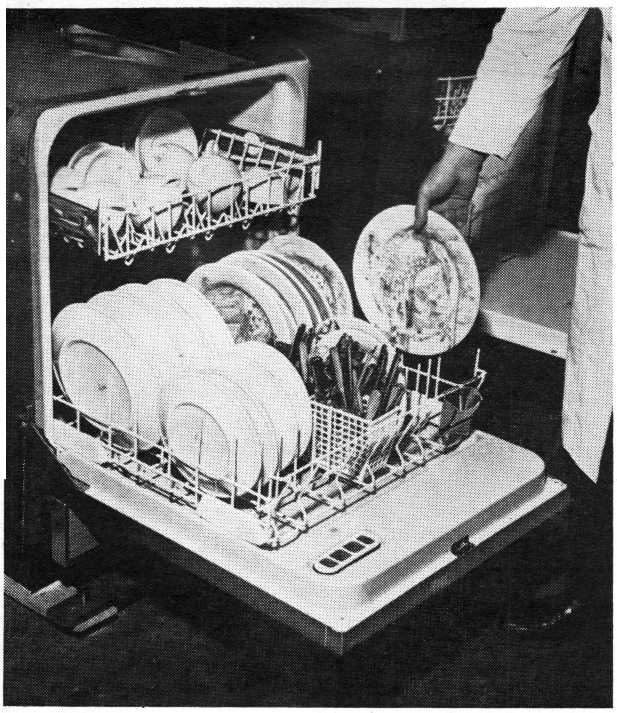
You might also assume that two wash periods would have to be better than one. And, indeed, all the machines tested except the economy *Whirlpool* provide for two detergent washes, the first to dispose of the bulk soil, the second to attack more stubborn residue with a fresh detergent solution. Moreover, most units also rinse before and/or between the washes, in addition to two or three times before drying. Even so, the single-wash economy *Whirlpool*, with no prior rinsing feature, ranked with the best of them in cleaning ability.

Finally, it might seem reasonable that a blower would help the electrical heating element to dry dishes faster and better. But the *KitchenAids*, with a blower-heater arrangement, were only slightly above average in drying ability. And though drying in the *Tappan* and *O'Keefe & Merritt* was thermostatically controlled rather than timed, these units, while among the best at drying, were still no better than the *Westinghouse*, *Hotpoint*, and *Frigidaire* with their simple systems of timed heat without any blower. Actually, though, the overall differences in drying ability were not judged to be very important. "Below average" performance simply means that a droplet or two of water might be left on some of the pieces in the load—and these can be taken care of merely by opening the compartment door at the end of the cycle and leaving it open while the dishes cool. Use of rinse conditioners, which encourage water to run off instead of forming into droplets, seemed to improve drying ability (they are likely to prove particularly useful in hard water areas, where spotting can be a problem). Dispensers for these conditioners are standard equipment with most de luxe machines and optional for others (see Ratings).

Special cycles

Since the four economy models CU tested did about as good a job of cleaning as their de luxe brand-mates, let's examine the extra features that differentiate one species from the other.

One attraction in de luxe models is the variety of apparently easy-to-use automatic operating cycles announced on their control panels. The full cycle takes about 45 to 60 minutes, up to half of which may be for drying. You'd ordinarily use this cycle for a mixed load of dishes, glassware, flatware, and cooking utensils. But for special loads,



Each afternoon hundreds of dishes, glasses, cups, and pieces of flatware were dirtied with 20 kinds of food, plus cigarette ashes, and left for a half-hour. Then, after the bulk soil had been scraped away, eight place settings were loaded into each machine, to be washed the following morning

you might want to reduce the number or length of certain operations in the normal cycle.

De luxe models provide pushbutton choice of shorter wash periods for such items as glassware, fine china, or lightly soiled or dusty dishes, and shorter drying periods for a load of pots and pans, which dry faster than dishes. For rinsing off a partial load that you want to wash later when the machine is full, there are rinse-and-hold cycles that remove most of the soil promptly before it can "age." But, esthetic considerations aside, this last option might be really necessary only on the less efficient machines; in CU's tests the check-rated models and the *Tappan* and *O'Keefe & Merritt* managed the heavily soiled and "aged" dish load perfectly well without pre-rinsing.

Still other choices are those that add to the control-panel display but can't really be counted as cleaning cycles. (The actual number of automatic cleaning cycles, as opposed to control choices, such as the "Short Wash" and the "Glass Wash" on the *Tappan* and the *O'Keefe & Merritt*, is noted for each model in the Ratings.)

On most machines, the position of the timer knob shows which stage of the cycle the machine is in. *Frigidaire* and *Sears*, however, have eliminated the timer knob completely; you need only press a selector button to start the machine on any cycle. But the *Frigidaire* provides no indication of where the machine is in the cycle, and its "cancel" control may involve up to a 10-minute rinse-and-drain delay before the machine can be reset. The *Sears* does have signal lights to let you know which stage of the cycle is operating (but not how long it has to go), and it can be readily advanced from one stage to another by means of a "changer button." Even so, the conventional systems, with visible timers, were judged somewhat more flexible, and it's likely that fewer things can go wrong with their simpler mechanisms.

Loads and loading

To see how much the machines would hold, we loaded each model with standard NEMA place settings, using fairly heavy china. A normal load might contain lighter china and would probably include a wider assortment of items (serving dishes, extra glasses, or snack plates) than the standard settings permit—particularly if you do a whole day's dishes at once. So the resulting estimates of dish capacity given in the Ratings are useful for comparative purposes only.

Most of the machines could hold about 12 place settings, with a maximum of 13 for the *KitchenAids* and a minimum of 11 for some other models. Manufacturers' claims ranged from two to six settings more than CU was able to fit into the machines.

A few variations in rack design are worth noting, particularly if you have odd-sized dishes to cope with. Movable props that can be set to accommodate particular pieces give some added flexibility to the upper racks of the *KitchenAid KDS-15*, *Tappan*, *O'Keefe & Merritt*, *Waste King*, *Thermador*, and *Frigidaire*. The upper rack of the *KitchenAid KDS-15* can also be adjusted vertically by about an inch to provide greater clearance at one level or the other. Several other models (*Sears*, *Gaffers & Sattler*, *Kelvinator*, *Magic Chef*) have this feature, too, but their racks are of a circular, rotating design. This design cuts down their total capacity to 11 place settings by wasting corner space with-

out, in our opinion, contributing very much to the ease of loading.

Removable racks were generally convenient to handle, though a bit of manipulation was needed with the lower racks of the *Tappan* and *O'Keefe & Merritt*, the upper racks of the *KitchenAids*, and both racks of the *Hotpoints*. Upper racks are not removable in the *Gaffers & Sattler*, *Sears*, *Kelvinator*, *Magic Chef*, and *General Electrics*.

Flooding and splashing

To prevent flooding in the event of some component failure or misuse of the timer, most machines either stop filling or start draining when the water reaches a certain level. The *General Electrics* were an exception, but flooding would be extremely unlikely to occur in them as a result of inappropriate control manipulation.

All models tested have a safety interlock switch designed to cut off the power if you open the door during a wash cycle to add a forgotten item. But the switch provided on the *Tappan*, *O'Keefe & Merritt*, and *Thermador* didn't prevent some water from splashing out onto the floor during CU's tests.

Noise of operation, in no case excessive, didn't vary much among models and, in any event, would depend to some extent on your own particular installation.

Assorted flaws

A few design deficiencies turned up in CU's tests. Glasses in the top rack of the *Tappan* and *O'Keefe & Merritt* were occasionally overturned by the water spray. This problem can be largely eliminated by slipping the glasses over the rack studs or using the movable partitions to restrain them. In the *Gaffers & Sattler*, *Sears*, *Kelvinator*, and *Magic Chef*, all similar models, it wasn't long before rusting developed in the tub bottom, where a little water is supposed to lodge to prevent the seals from drying out. All but *Gaffers & Sattler* have a field service kit available to rectify the trouble—but the modification did not prove completely successful on the one model (the *Sears*) on which it was tried by CU.

Food soil accumulated on the door and upper rack of the de luxe *General Electric*, partly because an ornamental trim strip across the front of the rack was so close to the closed door that it created a dirt trap. Having a serviceman remove the trim will correct this fault, which, according to the manufacturer, an increased rack-to-door clearance has eliminated in models designated as *SD-400B* (rather than *SD-400A*). But though either remedy may keep the door clean, CU doubts that these improvements would make for cleaner dishes. One of the *Hotpoint* samples leaked from around the door, but a serviceman's installation of an improved gasket, now included in the units in production, corrected the situation.

There were also some individual sample deficiencies. Some of the wheels on the *Tappan* dish rack fell off, and the mounting screws had to be tightened. Three dish props in the *Kelvinator's* upper rack had defective welds and were held in place only by their plastic coating. The interlock switch in the *Sears* door was not accurately positioned, so that the machine could be inadvertently run with the door slightly open, permitting leakage. Finally, the *Frigidaire* was incorrectly wired as received and wouldn't start.

Pits and pitfalls

Although dishwashers are relatively abuse-proof, they might be damaged if such hard materials as bones or fruit pits get past the filter and into the pump. However, most models filtered out all but quite tiny hard objects or caught them in a well. Only the *Hotpoints* let both cherry and olive pits get through to the pump. The *Westinghouse*, one of the more troublesome to disassemble, kept olive pits out but let cherry pits through. On the other hand, the pump impeller of the *Sears* hurled the pits out as fast as they fell in.

Still, since filters have to be at least coarse enough to let larger food particles be flushed from the machine in the course of washing, smaller items such as bone chips or slivers of glass might get past them. Although with a good dishwasher a thorough scraping of the plates will normally not be necessary, it may at times save some trouble. Fit glasses into the machine securely to prevent breakage, and do slender items, such as meat pins or pickle forks, by hand. And if ever your dishwasher should begin to make strange noises, turn it off immediately to minimize the chance of damage.

A word of warning, too, about the heating elements of dishwashers: though electrically safe, they can become hot enough in use to inflict a serious burn. Except in the *KitchenAids* these elements are in an exposed position under the lower rack near the filter (*Waste King's* would be particularly easy to touch). If you must reach into the machine while it's hot—say, to retrieve a fallen item—remember to avoid touching the element. And you should hold off on cleaning out the filter until the element has had time to cool down to a safe temperature.

Hot-water usage

An adequate hot-water supply—between 140° and 160°—is essential to good dishwasher performance. On most dishwashers the heating element used for drying also helps to maintain the water at the proper temperature during the wash cycle. Some of the machines tested also have an exterior layer of insulation to reduce heat loss (as well as noise).

Carrying the heating provisions a step further, nearly half the models tested have a thermostatically controlled booster-heating cycle (see Ratings). If water temperature is below that desired, the timer stops until the heating element brings it up. A booster can be useful to supplement a temporary shortage of hot water. But it shouldn't be regarded as a substitute for an adequate hot-water supply in your house, since it can add considerably to the time and cost of operating the dishwashing machine if used on a regular basis.

The machines tested used from 9½ to 15½ gallons of water, all hot, in the normal cycle. Sizable though this range may appear, it is probably not important enough to

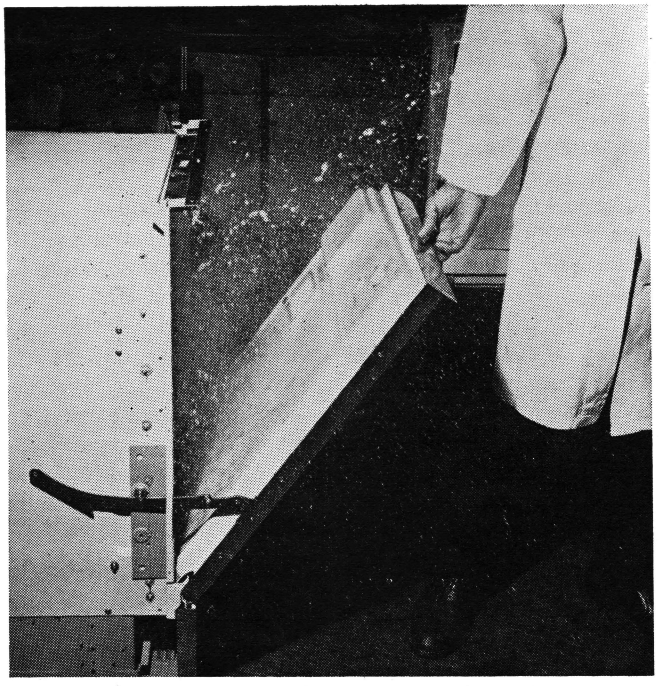
consider in selecting a model. None of the machines would use as much of your hot-water supply as, say, drawing a hot bath would, and a dishwasher uses the water in stages over a longer period.

Water hardness affects dishwasher performance and determines the amount of detergent to be used. You should start with the quantity recommended by the manufacturer, but you may have to experiment further to find the best amount to use in your household. Too little detergent will leave dishes greasy; too much can hamper rinsing and leave water spots.

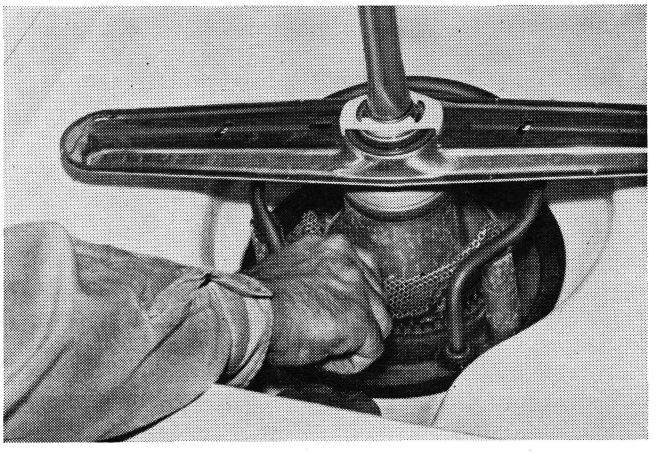
Some items can't withstand the high temperatures and strong detergents used in machine washing. Damage could occur, for example, to wooden articles, inexpensive thermoplastic dishes, china with an overglaze pattern, wooden- or plastic-handled flatware, and colored aluminum. Even conventional aluminum can be spotted by direct contact with dishwasher detergent. And cast-iron vessels will rust if their protective coating is removed by the detergent solution. Further, delicate crystal could topple and break from the vigorous spray. And cookware with baked-on or burned-on residue may still require hand-scouring. In actual practice, however, this long list of caveats will more than likely turn out to be much less formidable than it seems.

Some cost factors

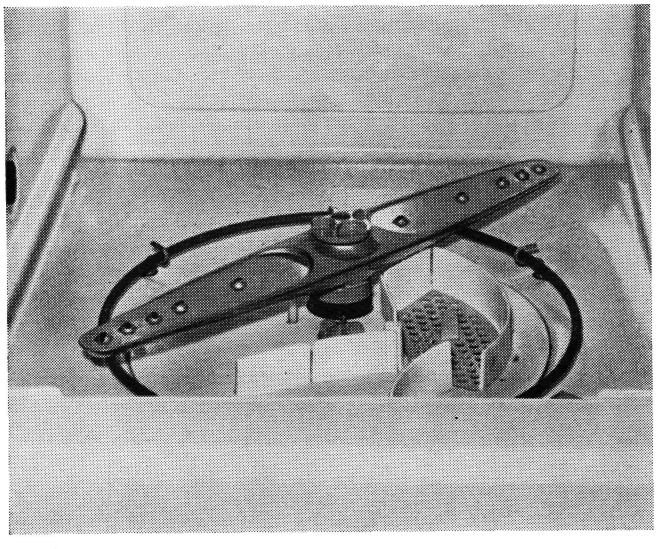
To the purchase price of a dishwasher—a highly unpredictable figure, as discussed on page 533—you have to add the cost of installation, including a separate 15-ampere branch circuit for some units or a 20-ampere branch circuit for others. Installation cost might run from $45 to $75 if the unit is placed adjacent to the sink. And, if elaborate plumb-

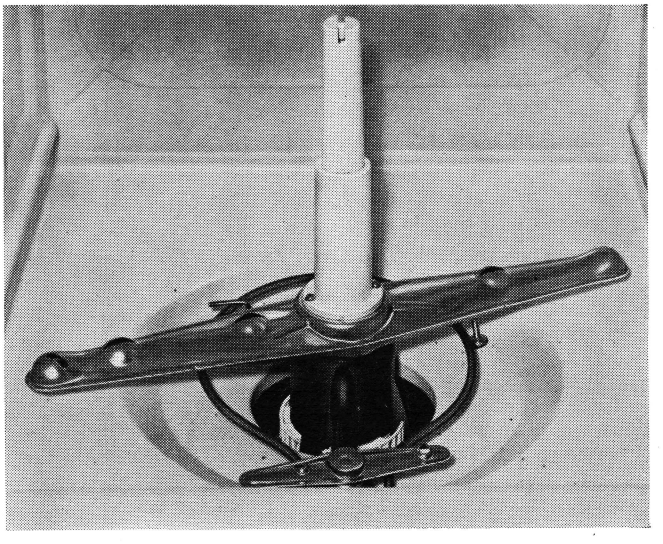


When the door was opened during operation, some models did not shut down quite in time to prevent a splashing



If you reach into the sump trap of the Waste King (right) for a fallen item, your hand will come very close to the heating element





Several spraying arms aren't necessarily best. The check-rated Whirlpool SLU 70-3 (below) did well with only one. The GE SD-400A (below right) washed less well despite a "tower" and two auxiliary arms (one not shown)

ing, wiring, and carpentry are involved, the cost might run much higher.

The cost of electricity to put the tested machines through their normal cycles, at 3¢ per kwh, ranged from 1¢ to 4¢ per cycle in CU's tests (a difference that might amount to some $10 a year), and detergent cost was around 3¢ or 4¢. Booster heating, under CU's test conditions, added from 10 to 40 minutes to a cycle at an extra cost of from ¾¢ to almost 2¢.

Most units tested have a variety of front-panel finishes available and also side panels for end-of-counter or free-standing installation. And all carried a one-year guarantee including parts and labor. But *KitchenAid, Whirlpool, Gaffers & Sattler, Magic Chef,* and *Thermador* delegate the responsibility for labor to the dealer, whose reputation for service thus becomes an important matter when you buy. *Tappan, O'Keefe & Merritt,* and *Waste King* limit their guarantee period to 30 months after the date of manufacture, *not* the date you purchased the machine—a small comfort if there are only a few months left in the period by the time you do your buying.

As the accompanying price survey shows (page 533), you stand a chance, depending on where you live, of being able to buy a top-rated de luxe model for not much more, and sometimes less, than one of the lowest-rated dishwashers would cost you. But what about the difference between what you'd have to spend for a de luxe model and for the economy model of the same brand? Would the extra features justify your paying the extra amount? CU believes that only you can answer this question, for the proper decision must depend on your own habits and needs.

RATINGS OF DISHWASHERS

Listed in order of estimated overall quality based on laboratory tests and engineering and convenience judgments. The models tested are generally available with a variety of front panel finishes and with side panels for end-of-counter or freestanding installations; check with your dealer. Prices are manufacturers' suggested retail; for most models discounts are available (see price survey on page 533).

All models are of the front-loading, undercounter type requiring a space about 34½x24x24 in. (height, width, depth), plus about 24 in. in front for door swing. All use hot water only, have a pump drain, are for operation on a-c only, and require their own branch circuit plus grounding. Except as noted, all models require a separate 15-amp. branch circuit and have a porcelain-coated interior, removable racks, rinse-conditioner dispenser, and wash cycle that can be interrupted or altered by manually resetting the timer. Dish capacities stated are the number of NEMA standard tableware settings that CU judged each machine could accommodate effectively (see story). Water consumption figures are the amount used per cycle, rounded to nearest ½ gal., with controls set for maximum consumption. Drying ability was evaluated using a rinse conditioner on all machines having a dispenser. Except as noted, filter systems required little or no cleaning during CU's washing tests. Specific convenience factors are included only where they were judged especially good or bad. Time for cycles is rounded to the nearest 5 min. Operating costs for electricity, calculated from a base of 3¢ per kwh, are rounded to the nearest ½¢.

ACCEPTABLE

WESTINGHOUSE SUF-4A (Westinghouse Electric Corp., Columbus, Ohio), $279.95. 2 wash arms. Water consumption, 12 gal. Capacity, 11 to 12 place settings. Washing performance, above average. Drying performance, above average. 3 automatic cycles plus option of booster water heating during wash and final rinse on 2 of them. Normal cycle, 60 min.; electricity cost, 2½¢ (excluding booster heating). Requires 20-amp. circuit.

KITCHENAID KDS-15 (Hobart Mfg. Co., KitchenAid Home Dishwasher Div., Troy, Ohio), $355. Single wash arm. Water consumption, 12 gal. Capacity, 13 place settings. Washing performance, above average. Drying performance, average. Upper rack judged somewhat difficult to remove; a minor inconvenience. Filter required occasional cleaning during tests. 3 automatic cycles plus option of booster heating during final rinse on 1 cycle. Normal cycle, 45 min.; electricity cost, 2¢.

KITCHENAID KDC-15 (Hobart Mfg. Co., KitchenAid Home Dishwasher Div.), $264. Single wash arm. Water consumption, 9½ gal. Capacity, 13 place settings. Washing performance, above average. Drying performance, average. Upper rack judged somewhat difficult to remove; a minor inconvenience. Filter required occasional cleaning during tests. Single automatic cycle, 45 min.; electricity cost, 1½¢. Optional rinse-conditioner dispenser *KRA5,* $15; not tested.

RCA WHIRLPOOL SLU 90-4 (Whirlpool Corp., Benton Harbor, Mich.), $279.95. 2 wash arms. Water consumption, 13½ gal. Capacity, 11 to 12 place settings. Washing performance, above average. Drying performance, below average but see story. 4 automatic cycles. Normal cycle, 50 min.; electricity cost, 2¢. According to the manufacturer, this model has been discontinued but may still be available in some stores.

RCA WHIRLPOOL SLU 70-3 (Whirlpool Corp.), $189.95. Single wash arm. Water consumption, 13 gal. Capacity, 11 place settings. Washing performance, above average. Drying performance, below average but see story. Lacks rinse conditioner dispenser. Single automatic cycle (with only 1 wash period), 50 min.; electricity cost, 2¢. According to the manufacturer, this model has been discontinued but may still be available in some stores.

¶ *The following models were comparable in washing performance to those preceding, but they were not check-rated because of the deficiencies noted.*

TAPPAN 6175 (Tappan Co., Mansfield, Ohio), $309.95. 2 wash arms. Plastic-surfaced interior. Water consumption, 14 gal. Capacity, 12 place settings. Washing performance, above average. Drying per-

formance, above average. Glasses in upper rack were occasionally overturned during tests (see story). Safety interlock did not prevent splashing when door was opened during cycle. Filter required occasional cleaning during tests. 3 automatic cycles plus option of booster heating during wash and final rinse on 1 cycle. Normal cycle time varies since drying is thermostatically controlled rather than timed; it was 50 min. under CU's test conditions. Electricity cost, 3½¢. Requires 20-amp. circuit.

O'KEEFE & MERRITT 61-5075 (O'Keefe & Merritt Co., Los Angeles), $324.95. Essentially similar to *Tappan 6175*, preceding. All comments apply.

¶ *The following models were somewhat poorer in washing performance than those preceding.*

HOTPOINT DA-65F (Hotpoint Div., General Electric Co., Chicago), $278. Single wash arm plus spray tower. Water consumption, 11½ gal. Capacity, 12 place settings. Washing performance, average. Drying performance, above average. 4 automatic cycles. Normal cycle, 60 min.; electricity cost, 1½¢. On CU's sample, water leaked past door seal; corrected by installing improved gasket, which is standard, according to the manufacturer, on units bearing serial No. 5YX5031 or higher.

HOTPOINT DA-36F (Hotpoint Div., General Electric Co.), $188. Single wash arm. Water consumption, 13½ gal. Capacity, 12 place settings. Washing performance, average. Drying performance, above average. Single automatic cycle, 60 min.; electricity cost, 1½¢. Improved door gasket, designed to prevent water leaking past door seal, is standard, according to the manufacturer, on units bearing serial No. 5YX3773 or higher.

FRIGIDAIRE DW-1UJ (Frigidaire Div., General Motors Corp., Dayton, Ohio), $275. Single wash arm plus spray tower. Plastic-surfaced interior. Water consumption, 14 gal. Capacity, 12 place settings. Washing performance, average. Drying performance, above average. 4 automatic cycles. No timer to set, but also no indication of the part of the cycle in progress (see story). Normal cycle, 60 min.; electricity cost, 4¢.

THERMADOR TD-91 (Thermador Div., Norris Thermador Corp., Los Angeles), $423.95. 2 wash arms. Stainless steel interior. Water consumption, 10 gal. Capacity, 12 place settings. Washing performance, average. Drying performance, average. Safety interlock did not prevent splashing when door was opened during cycle. Filter required occasional cleaning during tests. 2 automatic cycles. Normal cycle, 50 min.; electricity cost, 2¢.

WASTE KING DU900-200 (Waste King Corp., Los Angeles), $321.95. 2 wash arms. Plastic-surfaced interior. Water consumption, 15½ gal. Capacity, 11 to 12 place settings. Washing performance, average. Drying performance, below average but see story. Filter required occasional cleaning during tests. 3 automatic cycles plus option of booster heating during wash and final rinse or final rinse only on 1 cycle. Normal cycle, 55 min.; electricity cost, 2¢. Requires 20-amp. circuit.

GAFFERS & SATTLER GS-410 (Gaffers & Sattler, Los Angeles), $296.50. Single wash arm plus horizontal spray tube. Water consumption, 14 gal. Capacity, 11 place settings. Washing performance, average. Drying performance, average. Upper rack not removable. 2 automatic cycles plus option of booster heating during wash and/or final rinse on 1 cycle. Normal cycle, 50 min.; electricity cost, 2½¢. Considerable rusting in tub bottom after relatively short use (see story). Requires 20-amp. circuit.

SEARS KENMORE Cat. No. 6588 (Sears, Roebuck), $209.95 plus shipping. Essentially similar to *Gaffers & Sattler GS-410*, preceding, except for difference in controls and cycle timing. 4 automatic cycles; 1 includes booster heating during wash and final rinse. No timer to set; signal lights indicate part of cycle in progress (see story). All other comments apply.

KELVINATOR U972W (American Motors Corp., Detroit), $174.95. Not fully tested. Check-tests revealed machine is essentially similar to *Gaffers & Sattler GS-410*, above, except for differences in controls and cycle timing. 2 automatic cycles; no heat booster. Normal cycle, 55 min.; electricity cost, 3¢. Optional rinse-conditioner dispenser, $19.95. All other comments apply.

MAGIC CHEF UD44 (Magic Chef, Inc., Cleveland, Tenn.), $219.95. Not fully tested. Check tests revealed machine is essentially similar to *Gaffers & Sattler GS-410*, above, except for differences in control and cycle timing. Lacks rinse-conditioner dispenser. 2 automatic cycles; no heat booster. All other comments apply.

¶ *The following models were not as good in overall performance as those preceding, but they still could prove satisfactory for many users (see story).*

GENERAL ELECTRIC SD-400A (General Electric Co., Louisville, Ky.), $279.95. Single main wash arm, plus spray tower and 2 auxiliary arms. Plastic-surfaced interior. Water consumption, 12½ gal. Capacity, 11 to 12 place settings. Washing performance, below average. Drying performance, average. Upper rack not removable. Rinse-conditioner dispenser has to be reset manually for each use. 4 automatic cycles. Normal cycle, 50 min.; electricity cost, 1¢. Heavy soil accumulation on door and trim of upper rack in CU's sample corrected by serviceman's removing the trim; a change in rack design has eliminated the problem on models designated as *SD-400B*, according to manufacturer. But, in CU's opinion, change should not alter washing performance noticeably.

GENERAL ELECTRIC SD-200A (General Electric Co.), $189.95. Single wash arm plus spray tower. Plastic-surfaced interior. Water consumption, 12 gal. Capacity, 11 to 12 place settings. Washing performance, below average. Drying performance, below average. Upper rack not removable. Lacks rinse-conditioner dispenser. Single automatic cycle, 50 min.; electricity cost, 1¢.

WIDE-RANGING PRICES

The price you pay for a dishwasher depends not only on how much you shop around, but also on where you live. CU's shoppers reported a wide range of prices from 23 major metropolitan areas throughout the country; differences between the lowest and highest prices quoted for some models ran well over $100 and as high as $189 for the *Waste King*. The full range is not likely to be available in any single area, however, and there was no clear-cut geographical pattern to either the amount of the discounts or the range of prices an area's stores were offering. Nonetheless, these figures do provide a rough yardstick for judging the prices you are quoted. The average prices are rounded to the nearest dollar. All prices are for models with white front panels; no price includes installation.

	Range	Average
WESTINGHOUSE SUF-4A	$189.95-$319.00	$254
KITCHENAID KDS-15	255.00- 385.00	305
KITCHENAID KDC-15	202.00- 300.00	253
RCA WHIRLPOOL SLU 90-4	218.00- 339.00	273
RCA WHIRLPOOL SLU 70-3	174.00- 250.00	210
TAPPAN 6175	229.00- 299.95	264
O'KEEFE & MERRITT 61-5075	288.39- 339.95	284
HOTPOINT DA-65F	229.00- 319.95	268
HOTPOINT DA-36F	169.00- 269.00	199
FRIGIDAIRE DW-1UJ	212.00- 299.95	248
THERMADOR TD-91	269.95- 434.00	344
WASTE KING DU900-200	209.95- 399.00	310
GAFFERS & SATTLER GS-410	164.88- 296.50	236
SEARS KENMORE 6588*	219.95- 249.95	234
KELVINATOR U972W	159.00- 269.95	197
MAGIC CHEF UD44	174.00- 239.95	202
GENERAL ELECTRIC SD-400A	224.00- 349.00	275
GENERAL ELECTRIC SD-200A	152.50- 260.00	200

**For mail-order price, see Rating.*

Permanent-Press Shirts

TWO EARLY MODELS PERFORMED WELL IN PRELIMINARY TESTING

The newest wrinkle in men's wear is the permanent-press shirt, a postgraduate version of the familiar wash-and-wear shirt. Two early entries in the permanent-press parade were available in the New York area in time for pre-Christmas testing by CU. A forthcoming full-scale project, covering models introduced too late for this issue, should establish how closely later models will match these early ones. (It should also either resolve or confirm the doubts of a clothing manufacturer who was quoted recently in *Women's Wear Daily* as saying, "I got the feeling they are producing something they are not quite ready with.")

Meanwhile, our preliminary tests, together with a study of the technological literature, lead us to the interim conclusion that these shirts are in some significant ways superior to conventional wash-and-wear shirts, although certain production problems make it desirable to get a money-back or replacement guarantee at the time of purchase.

How permanent-press evolved

The ideal white shirt would not only be easy to launder at home but would look well and feel comfortable throughout the day and would withstand enough launderings and wearings to make it worth its price. Fabric processors and shirtmakers have worked in several directions—especially toward simplified upkeep—to bring the white shirt closer to this ideal.

Their first big step was the use of synthetic fibers that dry very rapidly and require very little if any ironing. But shirts made of these fibers are not absorbent enough for some men's hot-weather comfort. To improve absorbency and obtain a texture more like that of cotton, fabric manufacturers blended cotton with synthetics (usually polyesters, such as Dacron, Fortrel, or Kodel), producing what has become the most popular type of wash-and-wear fabric. The blended fabrics aren't quite as good at shedding wrinkles in the laundry as some of the all-synthetic fabrics, but shirts made of them can, if washed and dried with care, be worn with little or no ironing.

The cotton industry meanwhile developed resin-treated all-cotton wash-and-wear fabrics. This process, however, tends to reduce cotton's absorbency and, much worse, to shorten the life of the fabric. Some resins also cause the cotton fabric to become yellowish when bleached.

The permanent-press process up to now has been a marriage of the two basic approaches to wash-and-wear. The fabrics are blends of polyester and cotton treated with resins set by heat treatment. The strength of the polyester, which is unaffected by the processing, compensates for the loss of strength in the treated cotton. Permanent-press shirts now on the market or promised at the time of writing contain 50% to 65% polyester fiber.

Whereas the fabric in a wash-and-wear shirt has been fully treated before arriving at the shirtmaker's, the fabric in the permanent-press shirt is set into final shape *after* all shirt-manufacturing operations are completed. Thus, the shirtmaker is responsible for seeing that no wrinkle is accidentally but permanently set into the shirt during the curing process. To provide smooth, unwrinkled seams after the shrinkage involved in some of the setting processes, the shirtmaker may have to develop new sewing techniques. In fact, according to one trade journal, seam-puckering is considered the chief manufacturing problem at this time. In contrast to regular wash-and-wear shirts, however, the permanent-press shirts will show any seam-puckering problem they have *before* they are worn, not after the first or second laundering.

How the test shirts measured up

CU purchased 12 each of the only two permanent-press shirts that could be found on the retail market in the New York Metropolitan area early in August when testing had to begin. These were the *Wings Endura-Press 2031* (Wings Shirt Co., Inc., NYC), 65% Dacron polyester, 35% cotton, $5; and the *Arnold Constable Wrinkle Free Permanent-Press Finish A647C* (Arnold Constable Co., NYC), 65% polyester, 35% cotton, $4.98. A typical conventional wash-and-wear shirt, *Arrow Decton* (Cluett, Peabody and Co., Inc., NYC), made of 65% Dacron polyester and 35% cotton, was also included for purposes of comparison.

First, CU's textile engineers inspected the shirts to determine their design and workmanship and to be sure none of them was defective. Then they subjected the shirts to both laboratory and use tests. Some of the samples were repeatedly laundered and dried in a household-type washer and tumble dryer (as recommended by the manufacturers). Some were alternately given commercial and home-type launderings. During these cycles, the shirts were periodically measured and inspected. At the end of 25 laundering cycles, laboratory tests were made to determine fabric strength, seam strength, absorption, abrasion resistance, and shrinkage.

The results showed that there was very little difference

between the two permanent-press shirts in these physical characteristics, and very little between the shirts laundered and dried by home-type washing machine and dryer and those put through alternate home-style and commercial launderings. The compa[illegible]-wear shirt proved slightly superior in [illegible]ability, but CU cannot say that th[illegible]ed for by the difference in finish, since it is impossible to establish whether the basic fabrics used in all three were the same. In any case, the two permanent-press models were superior in strength and durability to most of the cotton wash-and-wear shirts we tested a few years ago (CONSUMER REPORTS, November 1963) and were about on a par with the polyester-cotton blends tested at that time.

All the shirts tested yellowed somewhat after many successive washings, but ordinary bleaching safely restored their whiteness.

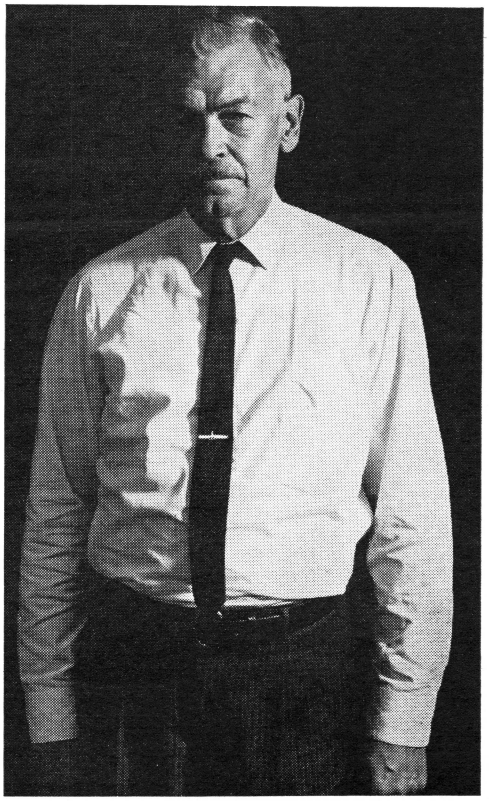
Meanwhile, other samples of the shirts were being use-tested. Three staff members wore the three test shirts in daily rotation, and CU's technical staff inspected the shirts morning and evening while they were being worn, as well as before and after laundering. The test panel members agreed that the permanent-press shirts were at least as comfortable in use as the comparison wash-and-wear shirt (the weather was hot and humid). It was also agreed that the permanent-press shirts, if carefully laundered and dried, presented a better appearance than the wash-and-wear shirt, especially in the areas of the seams, and retained this appearance throughout the day.

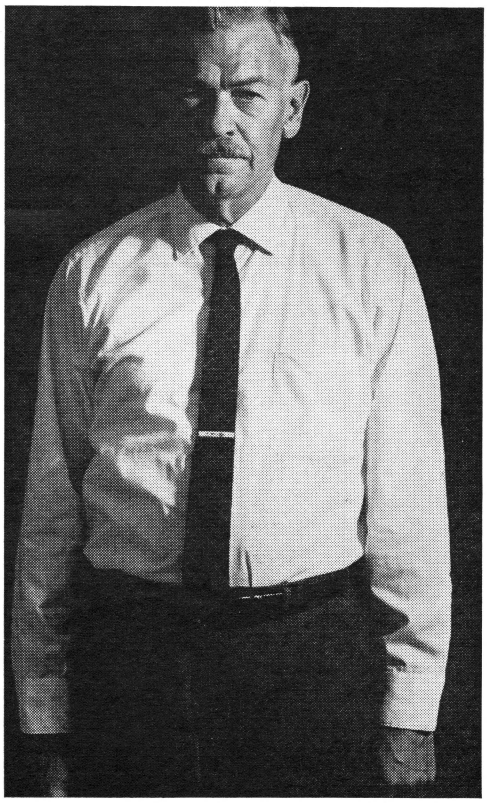
To see how important careful laundering and drying are, we did some hot-water washing with the fastest setting of the agitator and spin. The permanent-press shirts came out somewhat crumpled, but ironing at a low setting restored them to good condition, which persisted in subsequent washings. When the shirts were commercially laundered, wrinkles the laundry ironed in remained through at least one subsequent home-style laundering but generally disappeared after further launderings.

To make certain that a permanent-press shirt will perform at its best, we would recommend careful and gentle laundering and tumble-drying. For machine washing, you should use low water temperature (about 100°), low agitation speed, and low spinning rate, preferably in a small load (the smaller the better). Tumble-dry the load gently, with no heavy or large items such as towels or sheets included. Remove the shirt from the dryer as soon as the cycle ends and hang it on a hanger. Our findings indicate that a permanent-press shirt so treated is likely to remain substantially unaltered for perhaps as many as 20 cycles of wear and laundering (after which it may gradually begin to lose some of its "press").

During the 20 cycles, only the most fastidious are likely to wish to touch it up slightly with an iron. Drip-drying was not quite so kind to the permanent-press shirts, but even the traveler who must resort to it may find ironing unnecessary if he is willing to put up with slight wrinkles for a short while. CU noted that the appearance of the permanent-press shirts actually improved after a very brief period of wear.

It should be reemphasized that our findings in this report are tentative. How the shirts tested will compare with their rivals, present or future, CU cannot predict.





The photograph at near right shows an ordinary cotton shirt, which was home-laundered and ironed, as it appeared at the end of a hot and humid business day. At far right is a permanent-press shirt, also at the close of a similar day. This shirt had been home-laundered and dried 25 times without any ironing, and it was being worn for the first time on the day when this photograph was taken. A regular wash-and-wear shirt stood hot-weather use not quite so well as the permanent-press

Miniature AM Radios

The American who has totally escaped the miniature transistor radio must live a sheltered life indeed. Even if he doesn't own a set himself, he has almost surely been a captive audience for one on the street, at the beach, or in some other public place. For—as continuing sales of tiny radios, after six boom years, demonstrate—there are still plenty of listeners willing to put up with the miniature's generally less than dulcet tone quality in order to be able to carry a radio about in pocket or handbag. For this large group, CU tested a selection of the current miniatures and found that some had appreciably better tone quality than others. The sets also differed in economy and convenience of operation. As usual, there was no correlation between the number of transistors and quality.

List prices of the 19 sets rated ranged from about $10 to about $26, encompassing the medium and high price brackets for miniatures. (Two additional sets, a *Wards* and a *Penney*, were also tested, but because they have since been discontinued by their distributors, they are not included in the Ratings.)

In hopes of finding the top quality available, CU bought the top-priced model of each brand offering a choice and found that today's prices represent a significant drop from the $30-to-$50 range that prevailed about six years ago when CU last tested miniatures.

Words and music

The most noteworthy differences among the sets tested were in their tone quality, evaluated in jury listening tests. Still, in ranking the *Westinghouse* model at the top and calling its tone quality fair-to-good, CU is saying only that, among these sets, it sounded the best. The six sets in the second Ratings group were judged to have fair tone quality, just a little behind that of the *Westinghouse*, and they, too, should certainly be considered in shopping for a miniature. The voice-only programs heard over them and the *Westinghouse* will probably not sound objectionable to most listeners, but when an orchestra is playing, don't expect the *Westinghouse* or any of the other models tested to bring you sound that isn't likely to grow wearisome after a short while. These sets put forth a definite squawkiness that many listeners are not likely to tolerate well. True, miniatures are used widely and apparently happily for listening to rock and roll and "pop" singers. But, then, many people get a satisfying contact with such music merely from hearing the beat and basic melody. Eleven of the radios were judged fair-to-poor in tone quality. And one, which sounded worse than any of the rest, was judged poor.

Two of the radios, the *Sony* and the *Panasonic*, offer a degree of tone control in the form of a two-position switch that attenuates the treble and thus further restricts the limited tonal range. CU found that the best tone quality was attained on these sets with this switch in the maximum treble position.

In CU's listening test for speech intelligibility in noisy surroundings, even the sets with relatively poor tone were judged satisfactory. With the volume turned up to a reasonably high level, the panelists had no trouble understanding a voice program at a distance of six feet when the listening room was filled with sound such as that likely to be found at a crowded beach. In still noisier surroundings, intelligibility can of course be improved by earphone listening, and each tested radio came with an earphone. Since the set's speaker is cut off when the earphone is in use, this private listening might also improve the disposition of innocent bystanders.

Within the tone-quality groups in the Ratings, the sets are listed principally according to the merit of their electrical performance. Sensitivity, the ability of the set to respond to weak signals, is particularly important in portables, for they are often carried to places, between or away from stations, where the signals may be quite weak. Unlike some full-sized AM portables, none of the tested sets was so sensitive as to respond to extremely weak signals; however, 11 of them were sensitive enough to receive moderately weak signals and thus were rated good in this capacity. Eight others were judged fair and should be adequate in most metropolitan areas fairly close to the transmitter or in the nearby suburbs.

The sets' selectivity, judged only fair in all but one model, is unlikely to be a problem within a metropolitan area, because local stations are not adjacent in frequency. But you might have trouble with interference in locations where adjacent stations from two or more cities come in. Unfortunately, the set judged good in selectivity, the *Realtone*, was judged only fair-to-poor in tone quality.

Automatic volume control (AVC) is intended to keep a set's output at a constant volume as you tune from station to station. In addition, in a portable it tends to keep the volume constant as you carry the radio about by at least partially offsetting the directional effect of the set's built-in ferrite rod antenna. The majority of the sets were judged good or very good in AVC, none worse than fair.

Tuning in a station on any set so small, with its necessarily miniature dial and tiny tuning knob, is bound to present some difficulty. Certain models are a little better and others a little worse in this respect, but all need careful thumb work—if you move the knob precipitately, you may tune right past a station. CU has denoted as critical the tuning of every set whose dial was crowded at the high end of the band. One set that was free of this fault, the *Sony*, has a feature intended to make tuning even easier—a small meter next to the dial that indicates when a station is properly tuned in. Though this indicator did facilitate tuning, CU feels it hardly warrants spending more money for the *Sony*, highest in list price of the radios tested, than for a set not having the feature. In any event, the *Sony's* dial numbers were judged to be almost indecipherable.

The four models that run on penlight batteries should cost much less to operate than the 15 that use a 9-volt battery. Assuming two hours' use each day, CU estimates that 9-volt-battery sets may need a new battery (listing for 69¢) every nine to 15 days. Under the same conditions the models that use penlight cells should run on one set of batteries (50¢ per set of two) for about 23 days. Thus there is a considerable economy advantage in favor of penlight power, and the nuisance of replacement comes less often with penlight batteries, too.

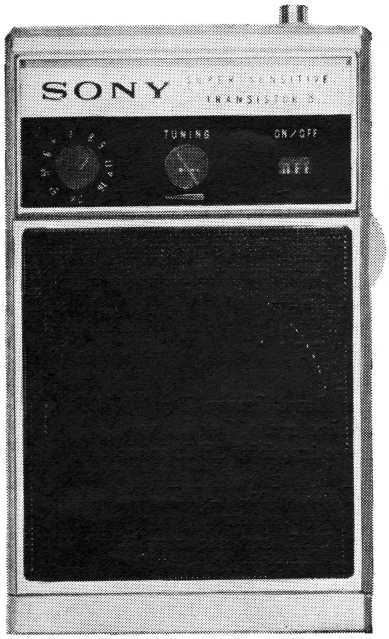
Three of the 9-volt battery sets, the *Philco*, *Truetone*, and *Sylvania*, offer an option apparently aimed at easing this expense and nuisance. At extra cost, you can get an a-c adaptor that permits these sets to be operated from house power. However, CU would not recommend such an adaptor for most set owners. After all, it can be used only where there is an electrical outlet, and once plugged in, a miniature loses its chief advantage—portability. Anyway, most homes have better-sounding sets for stationary use.

A more practical means of safeguarding battery life is an effective indication that the set is off when it is not being listened to. Three sets—the *Westinghouse*, *Sony*, and *Admiral*—show the word "off" in a front window when turned off. The *Motorola* has an indicator, too, albeit somewhat less explicit.

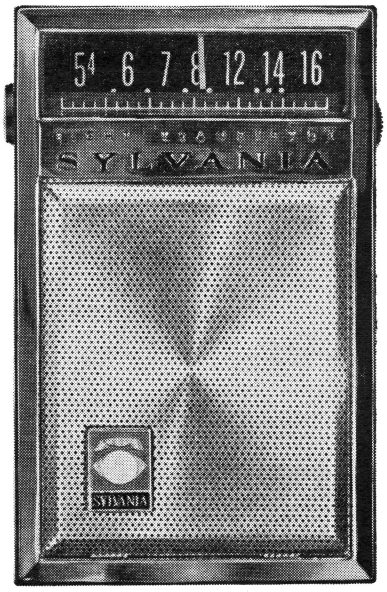
Which for you?

CU recommends that you choose from among the sets with fair-to-good and fair tone quality largely on the basis of actual (not list) price, since these radios are often discounted, and quality differences are hardly of a decisive character. When you go price-shopping for the high-rated sets, you will probably encounter many miniature radios not tested. There are literally scores of models on the market—some of which may be sold at prices as low as $5 or $6. If you fail to encounter a good deal on one of the recommended sets, you may find it worthwhile considering a set not tested. You can get a fair idea of how well it performs by making some tests of your own:

- Try to tune in stations between 1100 and 1600 on the dial. If you have trouble locating stations, try other sets.
- Tune in a strong station and turn the set around. If the volume changes disturbingly, try other sets.
- Take the radio to a busy section of the store or, with the store's permission, out on the street. There tune in a news

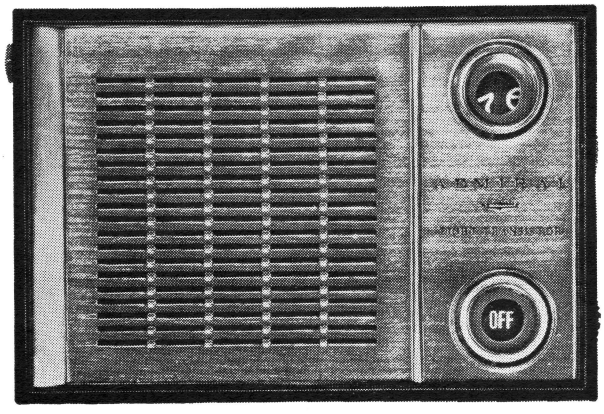


SONY TR-830



SYLVANIA TR54

Variations in the legibility of controls are illustrated by the comparatively easy-to-read log-scale dial of the Sylvania, the hard-to-read dial numbers of the Sony and Admiral, and the useful "off" indicators on the latter two sets



ADMIRAL YD201GP

broadcast from a strong station to see whether you can understand the announcer through the noise.

▪ Go to a quiet spot and tune in music from a strong station to judge the tone quality. Avoid interference (noise) from fluorescent lights.

In buying a set, whether rated by CU or not, try to get the dealer to agree to an exchange privilege. Then if you learn that your favorite nearby stations are received poorly or not at all on the set you've bought, you can go back and try to find a model with better sensitivity. Beyond that, it is worth reemphasizing that you shouldn't expect great things from any of these sets. But they will go in your pocket, ready for use whenever you like, and this feature obviously pleases millions of Americans, particularly young Americans.

RATINGS OF MINIATURE AM PORTABLE RADIOS

Listed by tone-quality groups (see story) and within groups, except as noted, in order of electrical performance. Differences between adjacent models are usually slight. Dimensions are in order of height, width, and depth to the nearest 1/4 in. Weights include batteries and, where supplied, carrying case. All models were judged to have satisfactory intelligibility in noisy surroundings, and all have a built-in antenna. Unless otherwise indicated, all models use a 9-volt battery; have a plastic case; lack a positive "off" indicator; and carry a 90-day warranty on parts, including labor. Prices are list and include earphone and, unless otherwise indicated, batteries and carrying case. Discounts are generally available.

ACCEPTABLE

FAIR-TO-GOOD TONE QUALITY

WESTINGHOUSE H-914P8GP (Westinghouse Electric Corp., Metuchen, N.J.), $14.95. 4¼x2½x1¼ in. 10 oz. Has positive "off" indicator. Tuning critical at high end of band. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, very good.

FAIR TONE QUALITY

ZENITH ROYAL R185C (Zenith Radio Corp., Chicago), $18.95. 4½x-2¾x1½ in. 10 oz. Uses 2 AA-size batteries. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, good. Warranty: 90 days on parts, excluding labor.

The top-rated Westinghouse, like nearly all the other sets tested, can easily be held and operated with just one hand

¶ *The following four models were judged about equal in overall quality. Listed in order of increasing price.*

SHARP BP-100 (Sharp Electronics Corp., Carlstadt, N.J.), $9.95. 2½x4½x1¼ in. 10 oz. Tuning critical at high end of band. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, good. Warranty: 1 year on parts, including labor for 90 days.

MAGNAVOX AM-81 (Magnavox Co., Fort Wayne, Ind.), $13.95. 4½x2¾x1½ in. 10½ oz. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, fair.

CHANNEL MASTER 6508 (Channel Master Corp., Ellenville, N.Y.), $19.95 excluding battery. 4¼x2½x1½ in. 10 oz. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, good.

TRUETONE DC3408 (Western Auto Supply Co., Kansas City, Mo.), $19.95 excluding battery. 4¾x3x1¼ in. 11½ oz. Has provision for a-c adaptor (not tested), available as *Part No. 3D7615*, $3.85, but see story. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, fair. Warranty: 1 year on parts, 90 days on labor.

¶ *The following model was judged slightly lower in overall quality than those preceding.*

CONTINENTAL TR-1085 (Continental Merchandise Co., Inc., NYC), $12.50. 4½x2¾x1¼ in. 10½ oz. Tuning somewhat critical at high end of band. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, good. Warranty: 1 year on parts, including labor, but with a $2.25 charge for handling and postage.

FAIR-TO-POOR TONE QUALITY

REALTONE TR 1069 (Realtone Electronics Corp., Jersey City), $13.95. 4½x3x1½ in. 10 oz. Tuning critical at high end of band. Sensitivity, good. Selectivity, good. Interference rejection, fair. AVC, good.

SYLVANIA TR54 (Sylvania Electric Prod., Inc., NYC), $20.30. 4x2½x1¼ in. 10 oz. Has a stand to prop up radio and provision for a-c adaptor (not tested), available at $9.95, but see story. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, good.

RCA VICTOR RGH 12E (RCA Sales Corp., Indianapolis), $11.98. 4½x2¾x1¼ in. 10 oz. Tuning somewhat critical at high end of

band. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, good. Warranty: 90 days on parts, excluding labor.

PHILCO NT-802 BKG (Philco Corp., Philadelphia), $13.95. 4¼x2½x1 in. 9 oz. Has provision for a-c adaptor (not tested), available at $7.95, but see story. Tuning somewhat critical at high end of band. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, good.

SONY TR-830 (Sony Corp. of America, NYC), $25.95. 4¼x2½x1½ in. 11 oz. Has 2-position tone switch and tuning indicator, but see story. Has positive "off" indicator. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, very good. Warranty: 1 year on parts, including labor.

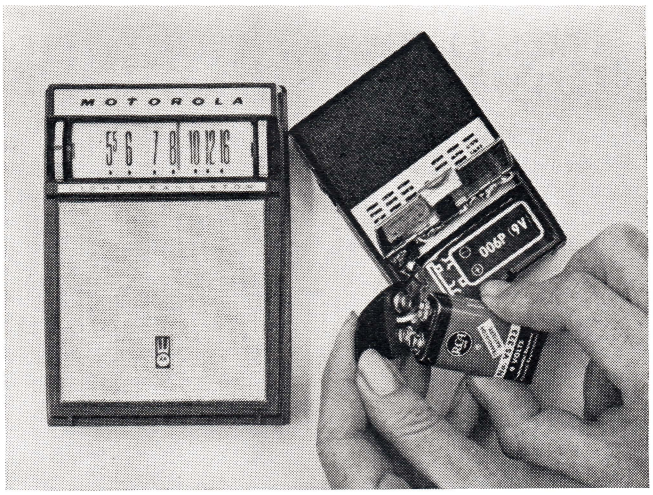
ADMIRAL YD201GP (Admiral Corp., Chicago), $12.95. 2¾x4¼x1 in. 10 oz. Has positive "off" indicator. Uses 2 AA-size batteries. Tuning critical at high end of band. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, fair. Warranty: 90 days on parts, except 5 years on etched circuit board, excluding labor.

MOTOROLA X60E (Motorola, Inc., Franklin Park, Ill.), $18.85. 4¾x3½x1½ in. 13½ oz. Has positive "off" indicator. Uses 2 AA-size batteries. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, fair.

SEARS SILVERTONE Cat. No. 6208 (Sears, Roebuck), $14.95 plus shipping, excluding carrying case; however, housing (simulated leather on plastic) has a carrying handle. 4¼x2¾x1½ in. 11½ oz. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, good. Warranty: 1 year on parts, 5 years on transistors, 90 days on labor.

ARVIN 64R38 (Arvin Industries, Inc., Columbus, Ind.), $16.95 excluding carrying case; however, housing (leather on plastic) has a carrying handle. 4¼x2¾x1½ in. 11½ oz. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, good.

GENERAL ELECTRIC P-1700 (General Electric Co., Utica, N.Y.), $14.95. 4½x3x1½ in. 14 oz. Uses 2 AA-size batteries. Tuning critical at high end of band. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, fair. Warranty: 90 days on parts, including labor, except 1 year on breakage of the housing.



The largest set tested is the Motorola, on the left; the smallest is the Panasonic, right. The back of the latter set has been opened up, to demonstrate how a user changes the 9-volt battery

PANASONIC R-607 (Matsushita Electric Corp. of America, NYC), $19.95. 3½x2½x1 in. 9 oz. Has 2-position tone switch and stand to prop up radio. Tuning critical at high end of band. Sensitivity, fair. Selectivity, fair. Interference rejection, fair. AVC, fair. According to the manufacturer, this model has been discontinued but may still be available in some stores.

POOR TONE QUALITY

HITACHI TH-680 (Hitachi Sales Corp., NYC), $13.95. 4½x2½x1½ in. 10 oz. Tuning somewhat critical at high end of band. Sensitivity, good. Selectivity, fair. Interference rejection, fair. AVC, good. Warranty: 1 year on parts, 90 days on labor.

AND FOR NOVEMBER . . . USE YOUR BUYING GUIDE

For those of our readers who are anxious to get an early jump on their Christmas buying this year, CU suggests supplementing the gift suggestions in this issue with items from the 1965 Buying Guide. Among the entries you may want to study before starting on your initial shopping trip are these:

- An early examination of your Christmas tree lights will save the last minute rush or disappointment that a defective string can cause when the family is gathered for the tree trimming. But before buying any replacements, it's worth reading the Buying Guide Issue's discussion of tree lights on page 77.
- Three popular gift categories for the youngsters are covered in the Buying Guide. The entry on sleds, page 348, provides Ratings as well as advice on what features to look for. On page 350 is a point-by-point check list of what to examine on a tricycle. And the basic considerations in choosing an electric train are noted on page 351.
- If a housewife on your list is down for a gift of bedding, consult page 43 of the Buying Guide Issue for information on wool and acrylic blankets and page 46 for information on percale and muslin sheets and pillowcases. Both entries include Ratings.
- The Buying Guide Issue has test information on an item that may be the elusive low-cost present for an audiophile. On page 117 are some facts on gauges for measuring a pickup's tracking force. The gauge recommended costs only $2. If your budget is more expansive, note that there are 27 pages in the Buying Guide devoted to the various audio components
- For many families, the holidays mean a turkey dinner. Before placing your order for the Christmas (or Thanksgiving) bird, you would do well to turn to pages 145 and 146 of the Buying Guide, where some important quirks of distribution and labeling of turkeys and other poultry are discussed.
- A small electrical appliance, well chosen, makes a welcome gift. The Buying Guide gives Ratings and buying advice for, among others, steam-spray irons (page 33), hair dryers (page 248), broilers (page 181), knife sharpeners (page 202), electric fry pans (page 177), and lightweight vacuum cleaners, both hand and upright types (page 62).

Gifts from Museums

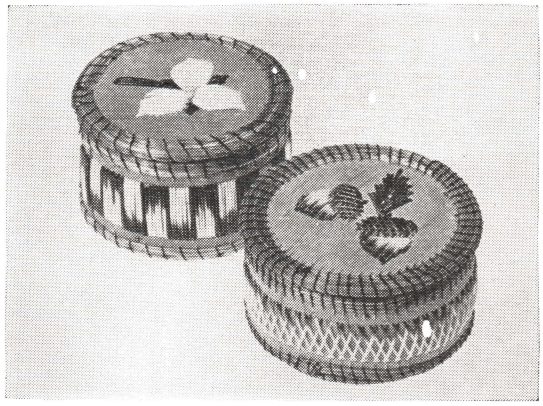
Museum shops throughout the country provide a way for those already weary of the commercial assault of the Christmas season to register a small note of protest—and also to avoid the more harrowing aspects of Christmas-in-the-stores. From museums you can buy something for almost anyone, knowing that profits will be used for noncommercial purposes.

Many museums offer a wide assortment of gift possibilities. You can choose from reproductions of paintings, sculpture, jewelry, glassware, and artifacts from various eras; contemporary pottery, ceramics, sculptures, jewelry, and handicrafts from many parts of the world; books about the arts and sciences; toys and games; and such other items as engagement calendars, note paper, or matchbooks illustrated with reproductions of paintings or drawings.

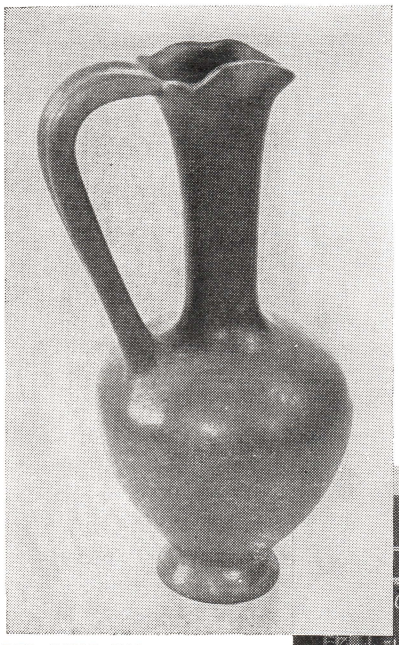
The sampling illustrated on these pages was chosen to reflect the variety of these museum gifts. If you plan to shop by mail, send for catalogs, including payment as indicated in the list on these pages, and make your selections early to allow time for the subsequent handling of your order. According to the Post Office Department, Christmas gifts should be in the mail by the following dates: Local domestic mail, December 14; out-of-town domestic mail, December 5; Alaska and Hawaii, December 1; Europe and Latin America, November 10; Africa and Near East, November 1.

STERLING SILVER CHARMS
Candlemold and porringer;
$4.50 each postpaid
Old Sturbridge Village,
Sturbridge, Mass.

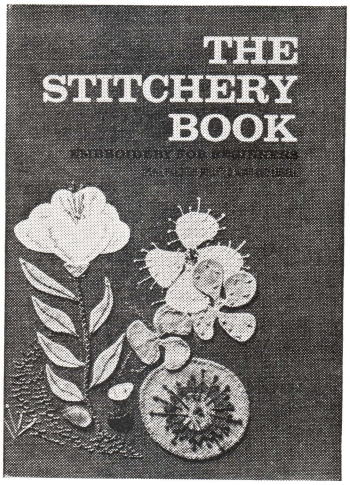
PENDANT MASK
Copy of an insignia of rank, Benin, Nigeria, 19th century. Bronze color. 5½ in. high;
$5 plus $1 parcel post
University (Pa.) Museum, Philadelphia



BIRCH-BARK BOXES WITH PORCUPINE QUILLWORK
Handmade by the Chippewa Indians in a revival of an ancient craft; no two exactly alike.
About 2 in. high, 3½ in. across; $4.95 each postpaid
Museum of the American Indian, NYC

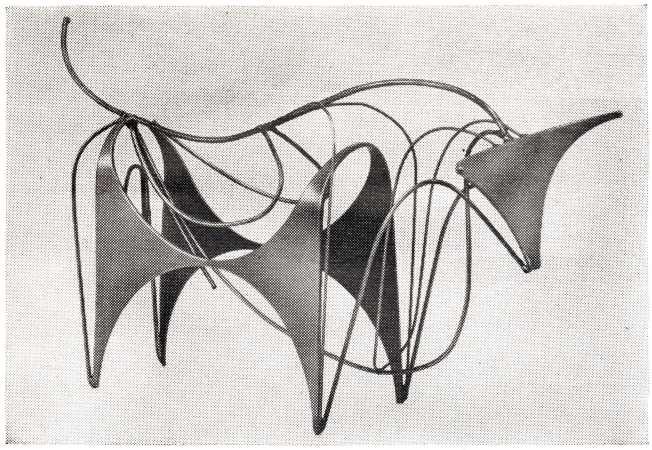


RED WINE JUG
Bucchero ware, from a Cypriot jug, 850-700 B.C.
9¾ in. high; $8.75 plus $1.25 mailing charge
Metropolitan Museum of Art, NYC

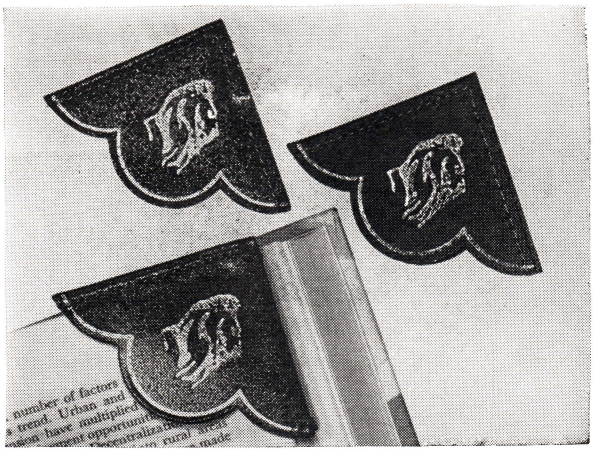


THE STITCHERY BOOK
Instructions and illustrations.
96 pages; $4.95 plus postage
Brooklyn Museum, Brooklyn, N.Y.

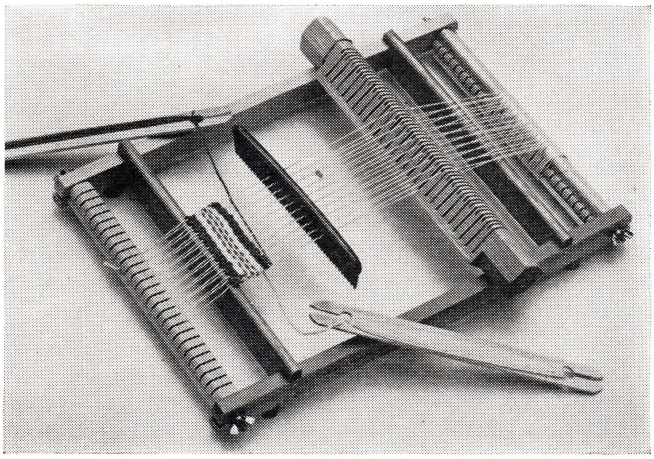
MEXICAN FIRE GOD XIUTECUHTH
Copy of carving, ca. 600-900 A.D.
Walnut book ends, 5¼ in. x 7¾ in.,
$20 a pair; as mask, $6 each. 50¢ mailing charge
Smithsonian Institution, Washington, D.C.



BULL SCULPTURE
Lacquered welded steel.
About 12 in. long; $20 postpaid
Munson-Williams-Proctor Institute, Utica, N.Y.



BOOKMARKS
Leather corner holders, assorted colors.
Sides about 2¼ in.; 45¢ each
New York Public Library, NYC



HAND LOOM
Wood with rubber feet; weaves up to 8-in widths.
9 in. x 13½ in.; $7 postpaid
(smaller version, $4.50; larger upright loom, $11.50)
Museum of the City of New York, NYC

IBIS
From a bronze casting, like those used for housetop and altar pieces, Benin, Nigeria. 8 in. high; $18 postpaid, American Museum of Natural History, NYC

SELECTED NONPROFIT SOURCES OF CHRISTMAS GIFTS

AMERICAN MUSEUM OF NATURAL HISTORY MUSEUM SHOP
Central Park West at 79 St., New York, N. Y. 10024
Catalog, 25¢

BALTIMORE MUSEUM OF ART, MUSEUM SHOP
Wyman Park, Baltimore, Md. 21218. No catalog

BROOKLYN MUSEUM, GALLERY SHOP
Eastern Parkway, Brooklyn, N. Y. 11238
Catalog, free

CORCORAN GALLERY OF ART, SALES DEPT.
Washington, D. C. 20006. Catalog, free
Gifts for Christmas should be ordered by Dec. 1

DE YOUNG MUSEUM SOCIETY, ART SHOP
Golden Gate Park, San Francisco, Calif. 94118
Catalog, 15¢

EVERSON MUSEUM OF ART
407 James St., Syracuse, N. Y. 13203. No catalog

FREER GALLERY OF ART, SMITHSONIAN INSTITUTION
Washington, D. C. 20560. Catalog, 15¢

FRICK COLLECTION, SALES DESK
1 East 70th St., New York, N. Y. 10021
Descriptive price list, free

METROPOLITAN MUSEUM OF ART
Box 255, Gracie Sta., New York, N. Y. 10028
Catalog, 25¢

MINNEAPOLIS INST. OF ARTS, MUSEUM SHOP
201 East 24th Street,
Minneapolis, Minn. 55404. No catalog

MUNSON-WILLIAMS-PROCTOR INSTITUTE, ART SHOP
310 Genesee St., Utica, N. Y. 13502. No catalog

MUSEUM OF THE AMERICAN INDIAN, MUSEUM SHOP
Broadway at 155th St., New York, N. Y. 10032
No catalog; inquiries individually processed and mail orders accepted

MUSEUM OF ART, RHODE ISLAND SCHOOL OF DESIGN
Providence, R. I. 02903. No catalog

MUSEUM OF THE CITY OF NEW YORK, MUSEUM SHOP
1220 Fifth Ave., New York, N. Y. 10029
Catalog, free

MUSEUM OF FINE ARTS, SALES DESK
Boston, Mass. 02115. Catalog, 25¢

MUSEUM OF MODERN ART, DEPT. A
P.O. Box 5300, Grand Central Sta.,
New York, N. Y. 10017
Catalog, 25¢ (deductible from any purchase over $5)

NATIONAL GALLERY OF ART, PUBLICATIONS FUND
Washington, D. C. 20565
Descriptive price list, free

NEW YORK PUBLIC LIBRARY, LIBRARY SALES OFFICE
Fifth Ave. and 42nd St., New York, N. Y. 10018
Descriptive price list of library publications, free

NEW YORK STATE MUSEUM AND SCIENCE SERVICE
Albany, N. Y. 12224. No catalog

OLD STURBRIDGE VILLAGE
Sturbridge, Mass. 01566. No catalog

PHILADELPHIA MUSEUM OF ART, MUSEUM SHOP
P.O. Box 7646, Philadelphia, Pa. 19101
Separate catalogs for sculpture reproductions, painting reproductions, and art books, 10¢ each

SAN FRANCISCO MUSEUM OF ART, BOOKSHOP
McAllister St. at Van Ness Ave.,
San Francisco, Calif. 94102
No catalog

SEATTLE ART MUSEUM
Volunteer Park, Seattle, Wash. 98102
Catalog, 10¢

SMITHSONIAN INSTITUTION
Room CMB07, Museum of History and Technology,
12th and Constitution Ave., Washington, D. C. 20560
Catalog, 25¢

STAMFORD MUSEUM GIFT SHOP
High Ridge Rd., Stamford, Conn. 06903
No catalog

UNIVERSITY MUSEUM, SALES DEPT.
University of Pennsylvania
33rd and Spruce Sts., Philadelphia, Pa. 19104
Catalog, 50¢

U. S. COMMITTEE FOR UNICEF
P.O. Box 22, Church St. Sta., New York, N. Y. 10008
Catalog, free

WADSWORTH ATHENEUM, SALES DESK
25 Atheneum Sq. No., Hartford, Conn. 06103
No catalog

WALKER ART CENTER, THE BOOK CORNER
1710 Lyndale Ave. So., Minneapolis, Minn. 55403
No catalog

WALTERS ART GALLERY, LIBRARIAN
Baltimore, Md. 21201. Catalog, 10¢

WORCESTER ART MUSEUM, SALES DESK
55 Salisbury St., Worcester, Mass. 01608
Catalog, 25¢ stamps or coin

Kitchen Blenders

THE CHECK-RATED MODELS DID WELL AT VISCOUS MIXING, DRY GRINDING, AND LIQUEFYING SOLIDS

In their fight for space on the kitchen counter, blenders are sprouting more pushbuttons, automatic timers, and other promotable touches. True, you still can't find a blender that will replace a food mixer when it comes to beating eggs, whipping cream, mashing potatoes, or coping with large quantities of food or heavy batters. But any of the 28 models CU tested will outperform a typical mixer at aerating fruit juices to enhance flavor, reconstituting powdered milk, or homogenizing ingredients into smooth, lump-free sauces. And blenders can of course also chop, pulverize, or liquefy solids, as no mixer was ever intended to do.

How they were tested

Our tests gave the blenders three basic chores: viscous mixing of a cheese dip, made by blending heavy cream, cream cheese, and Camembert; liquefying carrots into "carrot juice"; and dry grinding coffee beans. Even though a blender will not normally be used for grinding coffee, previous tests (see CONSUMER REPORTS, November 1960) have shown that grinding these beans provides a reliable guide to chopping ability. Test results were judged in terms of how well the job was done, the time required to do it, and the manual assistance needed to establish the essential circulation of ingredients within the blender's container.

CU found that no one blender did an outstanding job on all three test chores, but the check-rated *Wards Cat. No. 45820, Blendmor,* and *Blender Queen* did better overall than any of the other blenders. All three received an excellent rating on liquefying solids—they reduced the carrots to drinkable liquid in about one minute. They were judged good in dry grinding, an operation that no other Acceptable model performed any better than they did. And they were also judged good in homogenizing the cheese dip, though a number of models got a higher Rating on this task—in particular, the *Osterizer 232-06.* This unit was judged poor at liquefying solids and somewhat less convenient than many others to work with, but it was the only conventional model that was rated excellent at viscous blending. It produced a smooth, homogeneous cheese dip rapidly and with only moderate assistance. In contrast, some of the other models took up to twice as long and required considerable help. (The unconventional *Ronson 42201,* the best of the blenders at this chore, is discussed separately on page 547.)

Although the results of these three tests provided sound guidelines for ranking the overall performance of the blenders, additional checks on top-rated models were made using other foods. They revealed that it takes some experimenting to get the most satisfactory results out of even the best blenders. Chopped peanuts, for example, may suddenly turn into a kind of peanut butter if processed seconds too long; this job must be done with just a few short spurts of grinding action. The *Waring MR-10,* which had a speed setting appreciably lower than the other models, was particularly well suited for this sort of work, but it was rated Not Acceptable because of a serious deficiency (see below). In another common application, processing a baby food recipe of cooked beef, string beans, cooked rice, crisp bacon, and milk, all the check-rated models gave good results, but required an attentive hand for about a minute.

Timers and pushbuttons

The automatic 30-second timer, complete with pilot light, on the *Waring MR-9* and the Not Acceptable *Waring MR-10* offered limited usefulness, in CU's opinion, in view of the longer interval required for many blender tasks. Nor did technicians find that pushbutton panels or sliding switch indicators on the plush, eight-speed models would necessarily "take the guesswork out of blending." Much depends on the manufacturer's selection of speeds in relation to design of the container and the size and shape of the blades.

But gadgetry isn't the only factor shoppers need to consider—there's also the matter of storage. The two *GE* models, both relatively poor performers, were appreciably

less tall than other models—an advantage for those who want to use the blender on a counter beneath overhead cupboards. You might also be able to store one of these units, with its container in place, in a space that is too small for a taller model.

Some of the convenience of being able to store a blender with the container on the base ready for use, will be lost, though, if the container rocks on its base and the cover flies off when you pull the blender out to use it. We found that the container rested firmly on its base in most but not all models (see Ratings).

Removing the container from its base presented no problem except with the *Dormeyer*, on which considerable binding occurred, apparently as a result of corrosion.

Weights of the blenders tested ranged from 4 pounds (for the *National* and *Wards Signature 45820*) to about 11 pounds (for the *Hamilton Beach 8BW*).

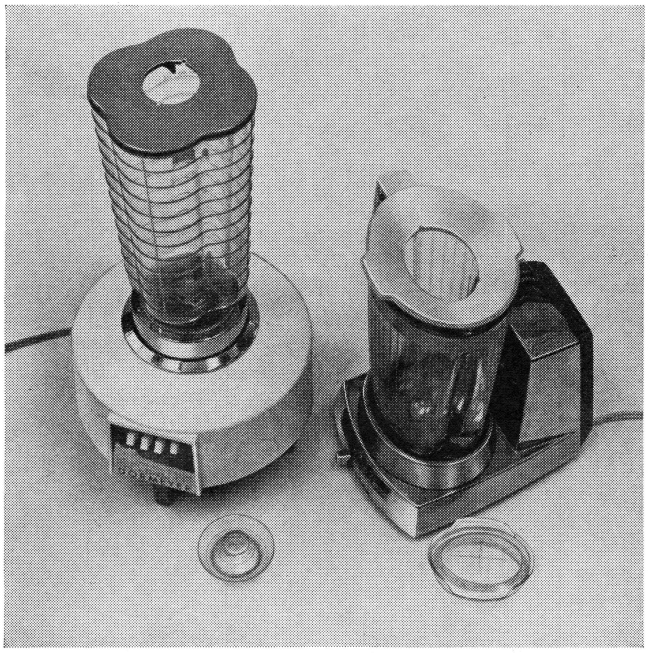
Optimistic capacities

The tall blender container promises more than it can accommodate without spillover, especially when its cup and ounce graduations extend to the brim. To test relative *useful* capacity, we measured the amount of water the blender would hold without running over when operating at its highest speed. Most deceptive of the lot turned out to be the *Shetland*, graduated up to 56 ounces, but with a relative useful capacity of 45.

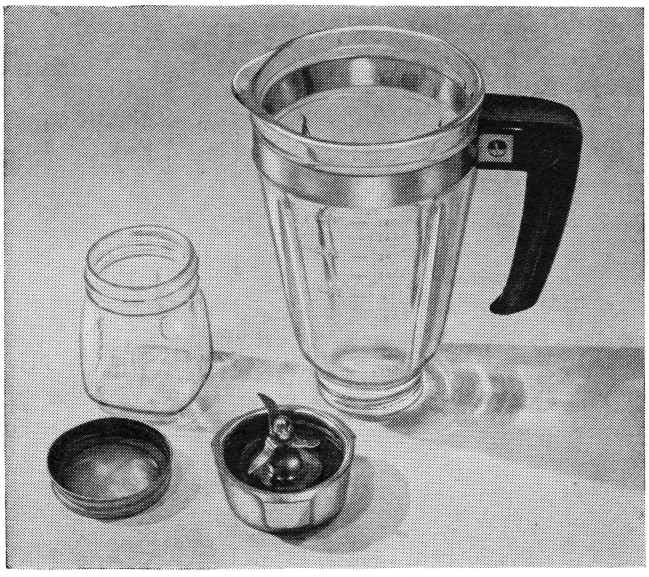
Blenders may be able to accommodate a larger quantity when the blending ingredients are more viscous than water; but, according to check tests in which we reconstituted nonfat dry milk, the capacity may be halved when a frothy mixture is blended.

If liquid splashes out of the blender, you may have more than a mess on your hands—an electrical hazard could result should some of the liquid penetrate the base. Our tech-

The check-rated units were at least good in all performance tests and rated high in convenience. Left to right are Wards Signature 45820, Blendmor M200HB, Blender Queen 777



With a container cap, you can add ingredients while the blender is running. The small cap of the Dormeyer, comparatively hard to remove and replace, is shown here with the easy-to-remove cap of the GE model on the right. Note the difference in height between the GE and the usual motor-below model



A removable base and cutter assembly is a real convenience in emptying thick, viscous mixtures as well as in cleaning, and it can be used with screw-top jars for mixing and storing many foods. This Sunbeam container (like ten others) has one

nicians therefore measured current leakage after water splashed out of the blender onto the motor housing. In addition, the usual electrical shock hazard test was made after 24 hours at high temperature and humidity.

The *Knapp-Monarch 40-509* showed dangerous current leakage in both instances. It was therefore rated Not Acceptable. (The *Sears Kenmore 82265*, no longer on the market, revealed the same deficiency, and CU warns any reader who owns one to let the unit dry out before using it again after an overflow.) Of the other units tested, only the *Iona* and the *Regent* presented a slight shock hazard in CU's tests. Nevertheless, CU suggests that, after a spillover, you make sure that you unplug your blender and dry it before continuing to use it. You should also mop up any spillage from the counter on which the unit is standing. CU found that, if operated while standing in a puddle, some units, at least, could become a more or less serious shock hazard because they might draw up enough liquid through ventilating holes in the bottom of the motor housing to cause electrical leakage to accessible metal parts. Incidentally, you should never leave liquids in the container: stored too long, they can promote corrosion as well as leaks through the cutter-shaft seal.

The sharp, rapidly rotating blades in a blender are also hazardous. They can cause a nasty injury if the blender is suddenly started up while one's hands are inside the container. A mishap of this sort was particularly likely to occur with the *Waring MR-10*—a slight, accidental touch on a pushbutton marked "clean" would set the blades spinning. This blender was therefore rated Not Acceptable.

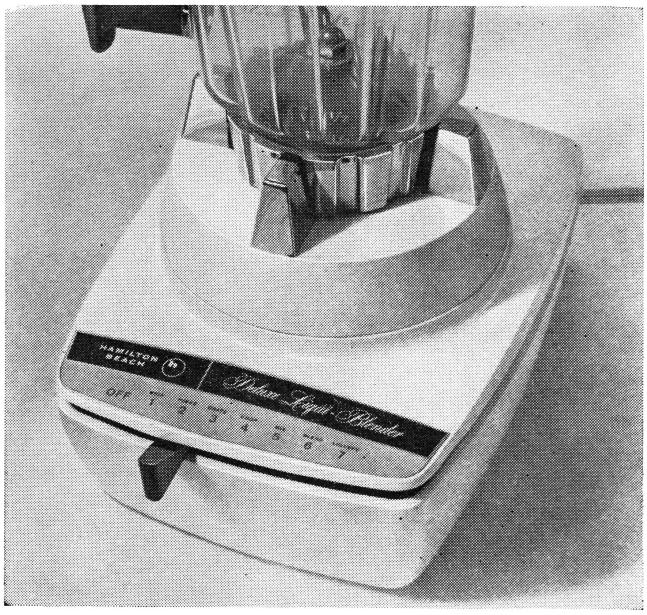
Chrome-finished models will usually cost more than those that have either a plastic motor housing or one with a baked enamel finish. Glass containers are found on some of the higher-priced models; those of the lower-priced units are more likely to be plastic. CU prefers glass to plastic because it is easier to clean and less easily scratched. However, the glass containers generally weigh from 3 to 4 pounds, or a good deal more than the 1 to 1½ pounds that the plastic containers weigh.

Features that you are more likely to find on the higher-priced models than on lower-priced ones include multi-speed operation and—a more important convenience, in CU's judgment—a cutter assembly that can be removed from the container. This latter feature can, of course, make cleaning easier on those occasions when the usual method of running the unit for a few seconds with a solution of warm water and detergent in it does not do the job. But its primary advantage is that it facilitates the removal of contents, particularly viscous mixtures, from the container after they are blended.

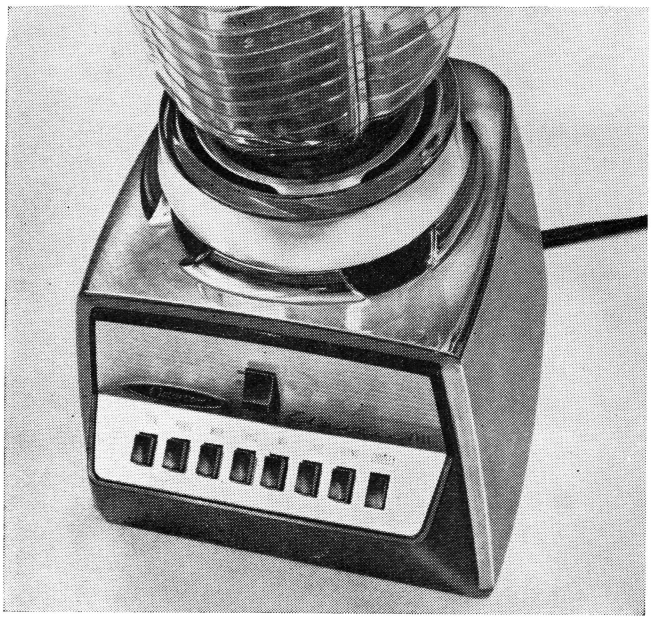
Some removable cutter assemblies are made to fit standard canning jars; others, wide-mouth Mason jars. Such designs can be a convenience if you want to process quantities of food for storage.

For less money

If you forego the convenience of having a cutter assembly that separates from the container, you may be able to save some money and still buy a good performer. The *Blendex HMD 40C* at $19.95, for example, compared well with some models at twice the price in CU's tests. Performance of the *Hamilton Beach 210W* matched that of the *Hamilton Beach 8BW*, which listed at about double its



Short bursts of speed are best for chopping or grating many foods. The Hamilton Beach 8BW (above), though it has seven



speeds, lacks the convenience of a separate on-off switch—as on the Osterizer (above), with its eight pushbutton speeds

price. The *8BW*, however, gave you the choice of seven speeds in addition to having a removable cutter assembly. On the other hand, the check-rated *Wards Signature 45820* had a removable cutter assembly, six speeds, and a list price of only $24.97 plus shipping; all of these virtues taken together plainly make it a Best Buy. The table on page 546 provides a broader picture of prices and discounts on the higher rated models.

Naturally, the delights of life with a blender are amply promoted in recipe books accompanying most models. The recipe and instruction books that came with the *Sunbeam BL-800*, *Waring MR-9*, and *Osterizer 541-01* were judged excellent by CU's home economist; those of both *Hamilton Beach* models, very good. But although the books generally offered a considerable amount of useful information, they also tended to exaggerate the blender's usefulness. For example, some gave directions for whipping cream—an operation for which a mixer or egg beater would be better suited. And there were those that disguised the fact that in some operations—producing cole slaw is one of them—a blender can handle only frustratingly small quantities at a time.

RATINGS OF ELECTRIC FOOD BLENDERS

Listed in order of estimated overall quality based on laboratory tests, engineering examination, and convenience judgments. All Acceptable models are for operation on a-c only. Except as noted, all were 2-speed models and have a container with a carrying handle. No attachments were tested. Prices are list; for most models substantial discounts are available, as the 22-market survey on page 546 indicates.

ACCEPTABLE

¶ *The following ten models all have a removable container base and cutter assembly (see story).*

WARDS SIGNATURE CAT. No. 45820 (Montgomery Ward), $24.97 plus shipping. 6 speeds. Useful capacity, 36 oz. Plastic container graduated to 40-oz. level in both ½ cups and oz. Performance: viscous blending, good; liquefying solids, excellent; dry grinding, good. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Relatively noisy. Fairly convenient to carry. Available in white, yellow, or blue; also in chrome as *Cat. No. 45830*, $29.97 plus shipping. ***A BEST BUY.*** Similar models (not tested): *Blendal NBC 806* (National Blenders, South Pasadena, Calif.), $44.95, and *Blendal NBC 1026*, $49.95.

BLENDMOR M200HB (National Blenders, South Pasadena, Calif.), $54.95. Availability limited; sold principally in health food stores. Useful capacity, 45 oz. Plastic container graduated to 48-oz. level in both ½ cups and oz. Performance: viscous blending, good; liquefying solids, excellent; dry grinding, good. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Average noise. Fairly convenient to carry. Available in white, pink, yellow, turquoise, or sandalwood; also in chrome or copper, $65.95. Similar model (not tested): *Master Deluxe 200* (Master Appliance Corp., Racine, Wis.), $64.95.

BLENDER QUEEN 777 (National Blenders), $43.95. Availability very limited; sold principally in demonstration sales through concessions. Useful capacity, 47 oz. Plastic container graduated to 48-oz. level in both ½ cups and oz. Performance: viscous blending, good; liquefying solids, excellent; dry grinding, good. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Relatively noisy. Fairly convenient to carry. Available in white, pink, yellow, turquoise, or sandalwood; also in chrome, $46.95. Came with guarantee promising free replacement of container if it cracks or breaks, with no time limit. Attachment: juicer, *700*, $30. Similar models (not tested): *Blendal 82HB* (National Blenders), $32.95, and *Blendal NBC 104HB*, $39.95.

OSTERIZER 541-01 (John Oster Mfg. Co., Milwaukee), $62.95. 8 speeds. Convenient pushbutton speed selection with separate on-off switch. Useful capacity, 45 oz. Glass container graduated to 4-cup (32-oz.) level in cups only. Performance: viscous blending, good; liquefying solids, good; dry grinding, fair. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Fairly quiet. Convenient to carry. Available only in chrome. Attachments: juicer, *345-01*, $30.50; ice crusher, *433-01*, $18.50; "blend and store" jars, *917-07*, 6 for $3.90. According to the manufacturer, this model has been discontinued but may still be available in some stores.

SUNBEAM BL-800 (Sunbeam Corp., Chicago), $59.95. Essentially similar to *Osterizer 541-01*, preceding, but has less convenient slide switch for speed selection in place of pushbuttons, and container is graduated in both ½ cups and oz. Also, container cover has large removable measuring cap; very convenient for adding ingredients while blender is running. Otherwise, same comments apply.

SEARS KENMORE Cat. No. 8249 (Sears, Roebuck), $40.75 plus shipping. Essentially similar to *Osterizer 541-01*, above, but has less convenient slide switch in place of pushbuttons for speed selection. Otherwise, same comments apply.

SUNBEAM BL-200 (Sunbeam Corp.), $34.95. Useful capacity, 39 oz. Glass container graduated to 32-oz. level in both ½ cups and oz. Performance: viscous blending, fair-to-good; liquefying solids, good; dry grinding, fair-to-good. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Fairly quiet. Convenient to carry. Available only in chrome. Attachments: ½ pint blender jar, $3.90 per set of 6; ice crusher (available in January 1966), $17.95.

HAMILTON BEACH 8BW (Hamilton Beach, Div. of Scovill Mfg. Co., Racine, Wis.), $47.95. 7 speeds. Useful capacity, 42 oz. Plastic container graduated to 44-oz. level in both ½ cups and oz. Performance: viscous blending, very good; liquefying solids, good; dry grinding, fair-to-poor. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Average noise. Convenient to carry. Convenient power cord storage compartment. Available in white; also in chrome as *8BC*, $57.50. Attachment: ice crusher, *561*, $14.50.

RIVAL 910 (Rival Mfg. Co., Kansas City, Mo.), $32.95. Useful capacity, 47 oz. Plastic container graduated to 44-oz. level in both ½ cups and oz. Performance: viscous blending, very good; liquefying solids, fair; dry grinding, fair-to-good. Container cover has large removable measuring cap; very convenient for adding ingredients while blender is running. Relatively noisy. Convenient to carry. Available in white; also in chrome as *910C*, $37.95.

WESTINGHOUSE HA-10 (Westinghouse Electric Corp., Mansfield, Ohio), $31.88. Useful capacity, 39 oz. Plastic container graduated to 40-oz. level in both ½ cups and oz. Performance: viscous blending, fair; liquefying solids, excellent; dry grinding, good. Container cover has removable measuring cap; convenient for adding ingredients while blender is running. Quietest of all models tested. Fairly

KITCHEN BLENDER RATINGS
continued

convenient to carry. Available in sandalwood; also in chrome as *HA-30*, $38.95.

¶ *The following six models were judged less convenient overall than any of those preceding. None had a removable container base and cutter assembly (see story).*

BLENDEX HMD 40C (National Blenders), $19.95. Useful capacity, 39 oz. Plastic container graduated to 40-oz. level in both ½ cups and oz. Performance: viscous blending, fair-to-good; liquefying solids, very good; dry grinding, good. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running because relatively large opening is not recessed in cover. Container shape makes removal of viscous fluids comparatively inconvenient. Relatively noisy. Fairly convenient to carry. Available in white, pink, yellow, turquoise, or sandalwood; also in chrome as *HMD 41*, $22.95.

WARING MR-9 (Waring Prod. Co., Winsted, Conn.), $58.95. Useful capacity, 36 oz. Glass container graduated to 40-oz. level in both cups and oz. Performance: viscous blending, good; liquefying solids, good; dry grinding, fair. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running because, although opening is larger than most, it is not recessed in cover and cap was comparatively difficult to remove and replace. Relatively noisy. Fairly convenient to carry. Has timer that shuts off blender automatically at selected time up to 30 seconds (judged limited in usefulness). Available in white; also in chrome as *MR-9C*, $62.95. According to the manufacturer, this model has been discontinued but may still be available in some stores. Attachments: ice crusher, *BA-1*, $16.95; coffee mill, *BA-2*, $17.95; knife sharpener, *BA-3*, $4.95.

HAMILTON BEACH 210W (Hamilton Beach, Div. of Scovill Mfg. Co.), $23.95. Useful capacity, 32 oz. Plastic container graduated to 32-oz. level in both ½ cups and oz. Performance: viscous blending, very good; liquefying solids, good; dry grinding, fair. Container cover does not have removable cap, an inconvenience. Container shape makes removal of viscous fluids comparatively inconvenient. Relatively noisy. Convenient to carry. Available in white; also in chrome as *210C*, $28.95. Attachment: ice crusher, *561*, $14.50.

REGENT B-6P (Iona Mfg. Co., Inc., Manchester, Conn.), $18.95. Useful capacity, 41 oz. Plastic container graduated to 48-oz. level in both ½ cups and oz. Performance: viscous blending, good; liquefying solids, good; dry grinding, poor. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running because opening is not recessed in cover. Fairly quiet. Slight current leakage found after exposure to high relative humidity and also following spillage of water on motor base; judged a possible annoyance rather than a hazard. Relatively inconvenient to carry because container did not seat securely on base. Available only in white.

OSTERIZER 232-06 (John Oster Mfg. Co.), $26.95. Useful capacity, 38 oz. Plastic container graduated to 4-cup (32-oz.) level in cups only. Performance: viscous blending, excellent; liquefying solids, poor; dry grinding, fair-to-good. Container cover does not have removable cap, an inconvenience. Container shape makes removal of viscous fluids less convenient than with any other model tested. Relatively noisy. Convenient to carry. Available in white; also in chrome as *232-01*, $29.95. Attachments: juicer, *345-01*, $30.50; ice crusher, *433-01*, $18.50.

IONA B-1 (Iona Mfg. Co., Inc.), **$25.95.** Useful capacity, 33 oz. Glass container not graduated. Performance: viscous blending, fair; liquefying solids, very good; dry grinding, fair. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running because opening is not recessed in cover. Relatively noisy. Slight current leakage found after exposure to high relative humidity and also following spillage of water on motor base; judged a possible annoyance rather than a hazard. Relatively inconvenient to carry because container did not seat securely on base. Available in white or beige; also in chrome as *B-1-C*, $28.95.

¶ *The following nine models had poorer performance than any of those preceding. Except as noted, none had a removable container base and cutter assembly (see story).*

DORMEYER BL-2 (Dormeyer Div., Webcor Sales Co., Chicago), $41.95. 3 speeds. Useful capacity, 38 oz. Plastic container graduated to 40-oz. level in both cups and oz. Performance: viscous blending, fair; liquefying solids, fair; dry grinding, fair-to-poor. Container cover has removable cap (not a measuring cap), but fairly inconvenient for adding ingredients while blender is running because opening is not recessed in cover and cap was comparatively difficult to remove and replace. Removable container base and cutter assembly. Noisiest of all models tested. Convenient to carry. Container lacked handle, a minor inconvenience. In CU's sample, container

THE PRICES OF BLENDERS

To find out how discounts run on blenders, CU asked shoppers in 22 market areas throughout the country to price the *Ronson* and 11 of the 12 top-rated blenders. (The *Sears Cat. No. 8249* was obtained too late to be included in the price study.)

The two lowest-priced models were the *Blendex* (a good performer but judged less convenient than higher-rated blenders) and the check-rated *Wards*. For both, the price spread quoted was very narrow, only about $5. At an average of about $26, the *Wards* was clearly a Best Buy among the three check-rated blenders. The prices quoted for the *Blendmor M200HB* (sold principally in health food stores) averaged more than $51, making it the most expensive of the models surveyed. The shoppers were unable to find the *Blender Queen 777* in enough stores to list an average for it. Where they did get a quotation, it was the $43.95 list price.

The ranges in prices quoted were generally much larger for other models than for the *Blendex* and *Wards*. Widest of all was the *Osterizer 541-01* with a spread of $23.88. Average prices in the table are rounded off to the nearest dollar.

	Range	Average
BLENDEX HMD 40C	$16.95-$21.47	$19
BLENDMOR M200HB	35.73- 54.95	51
HAMILTON BEACH 8BW	31.87- 49.95	38
OSTERIZER 541-01	39.07- 62.95	47
RIVAL 910	28.95- 34.95	32
RONSON 42201	33.83- 49.88	40
SUNBEAM BL-200	23.50- 35.00	32
SUNBEAM BL-800	43.00- 57.95	49
WARDS SIGNATURE 45820	24.88- 29.98	26
WARING MR-9	39.88- 49.99	46
WESTINGHOUSE HA-10	22.88- 34.95	30

NEW DESIGN, NARROW TALENT

No blender is a Jack-of-all-trades, but the *Ronson 42201* (Ronson Corp., Woodbridge, N.J., $54.95) is easily master of one. It's the task a blender may have to perform most often—blending viscous mixtures. In CU's tests, the *Ronson* did the job rapidly and well—and required no assistance at all in the process. Its radical design tells the story. Unlike the usual blender, the *Ronson* has a container that is wide at the bottom and narrows at the top. Comparatively large and dull blades replace the small, sharp ones that most blenders employ.

Unfortunately, the *Ronson* did not do nearly so well in tests for liquefying solids and dry grinding. In these tasks it was outperformed by even the poorest of the conventional models, in spite of its having five push-botton-controlled speeds. But its plastic container had the largest useful capacity of all those tested (48 oz.) and, when blending a frothy mixture, the smallest relative capacity loss. Moreover, the *Ronson* had the most convenient measuring cap, a removable cutter assembly, relatively quiet operation, and latches that strapped the container to the motor housing for stability. In short, it is a blender to consider if you are willing to forego versatility in favor of the *Ronson*'s special ability with viscous mixtures.

was sometimes very difficult to remove from base. Available in white, pink, yellow, or turquoise.

SHETLAND BL9007 (Shetland Co., Inc., Salem, Mass.), $19.95. Useful capacity, 45 oz. Plastic container graduated to 56-oz. level in both ½ cups and oz. Performance: viscous blending, fair; liquefying solids, fair; dry grinding, fair. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running because opening is not recessed in cover. Relatively noisy. Relatively inconvenient to carry because container did not seat securely on base. Available in white only and, without container handle, as *BL9003*, $17.95.

GENERAL ELECTRIC BL-2 (General Electric Co., Bridgeport, Conn.), $35.75. Useful capacity, 44 oz. Glass container not graduated. Performance: viscous blending, fair; liquefying solids, poor; dry grinding, poor. Container cover has large removable measuring cap; very convenient for adding ingredients while blender is running. Fairly quiet. Unusual design with motor behind container instead of below makes for a more compact unit, 4 to 6 in. lower than most other models. However, this design and the fact that container did not seat securely on base made the unit relatively inconvenient to carry. Available only in chrome.

GENERAL ELECTRIC BL-1 (General Electric Co.), $28.98. Essentially similar to *General Electric BL-2*, preceding, except container is plastic and unit is available in brown-and-white only. Otherwise, same comments apply.

WARING BL-1 (Waring Prod. Co.), $24.95. Useful capacity, 37 oz. Plastic container graduated to 32-oz. level in both cups and oz. Performance: viscous blending, fair-to-poor; liquefying solids, fair; dry grinding, fair. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running: though opening is recessed in cover, recess is very shallow. Average noise. Relatively inconvenient to carry because container did not seat securely on base. Available only in chrome. Attachment: ice crusher, *WA-1*, $16.95.

NATIONAL DD 600 (National Blenders), $19.95. Useful capacity, 27 oz. Plastic container graduated to 4-cup (32-oz.) level in ½ cups only. Performance: viscous blending, fair-to-poor; liquefying solids, fair; dry grinding, fair. Container cover has removable measuring cap, but only fairly convenient for adding ingredients while blender is running because opening is not recessed in cover. Container shape makes removal of viscous fluids relatively inconvenient. Average noise. Available only in chrome.

WARDS SIGNATURE Cat. No. 45815 (Montgomery Ward), $16.50 plus shipping. Essentially similar to *National DD 600*, preceding. Same comments apply.

KNAPP-MONARCH 40-500 (Knapp-Monarch, St. Louis), 19.95. Useful capacity, 27 oz. Plastic container graduated to 4-cup (32-oz.) level in cups only. Performance: viscous blending, fair-to-poor; liquefying solids, poor; dry grinding, poor. Container cover does not have removable cap, an inconvenience. Plastic cover cracked in use. Container shape makes removal of viscous fluids relatively inconvenient. Fairly quiet. Relatively inconvenient to carry because container did not seat securely on base. Available in white or brown; also in chrome with base carrying handles, as *40-501*, $24.95.

SEARS KENMORE Cat. No. 8220 (Sears, Roebuck), $16.50 plus shipping. Essentially similar to *Knapp-Monarch 40-500*, preceding. Available only in chrome. Otherwise, same comments apply.

NOT ACCEPTABLE

¶ *The following models, listed alphabetically, are rated Not Acceptable for the reasons noted.*

KNAPP-MONARCH 40-509 (Knapp-Monarch), $44.95. Excessive current leakage after exposure to high relative humidity and also following spillage of water on motor base.

WARING MR-10 (Waring Prod. Co.), $62.95. Blender could be started at a light touch of a pushbutton intended to permit short-time operation as an aid to cleaning. Possibility of blender's being started unexpectedly by accidental contact with the pushbutton was judged a potential hazard.

Chemistry Sets

THE ART IN GIVING THEM IS TO HELP A CHILD ENJOY SCIENCE WHILE KEEPING HIM FROM HARM

The parent who wishes to introduce a child to chemistry can buy a chemistry set for as little as $1 or as much as $40. The $1 sets usually give chemicals, equipment, and instructions for about 10 experiments, and the accent often is on magic tricks or detective work. The most expensive sets come packaged as miniature laboratories with an extensive array of chemicals and toy versions of such laboratory apparatus as a balance, spectroscope, and centrifuge.

Of 24 sets bought, the majority represented three major brand lines, *Lionel-Porter Chemcraft, Gilbert Chemlab,* and *Skil-Craft.* It was evident that their manufacturers keep close tabs on one another and manage to offer pretty much the same features, although *Chemcraft* and *Skil-Craft* have succeeded in creating a missile gap between themselves and *Gilbert* by including what *Skil-Craft* calls "solid fuel" (baking soda) rockets in some sets. But be this as it may, the various sets from all the manufacturers offer experiments of the kinds that have been enthralling children—or leaving them cold—for several generations.

There's no telling, of course, whether the magical, the space-age, or the basically academic approach to chemistry has the best chance of inspiring a serious interest in a particular child. Science educators consulted by CU for this report were definitely against selling magic tricks as chemistry sets. One set in particular, *The Mad Mad Mad Scientist Laboratory,* appealed mainly to fantasy, labeling its chemicals as ingredients in a witch's brew ("Leech's love dust," "Ghoul's globule," etc.). It did suggest in its "Note to parents" that "this is a very sneaky way for kids to have fun while learning about chemistry." Although the consultants took strong issue with this line of reasoning, some children might have fun with the set anyway.

More serious were the shortcomings of *Adventures in Science Chem-Sets* of the *Homelab* brand line. These sets are rated Not Acceptable, for they completely ignored certain important regulations under the Federal Hazardous Substances Labeling Act. Among the chemicals in each set, none of those CU judges hazardous was labeled with a cautionary statement, nor was the required general warning statement on the box and the instruction leaflet.

It will be wise to ponder the latter warning before shopping for any chemistry set. It reads, "WARNING—This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision."

The implications are plain and important. First, free-style experimentation of any sort must be ruled out. The Big Bang image of childhood chemistry may be more common in the funny papers than in real life (though fires can occur from the mishandling of alcohol lamps included in some sets). Actually, though, as anyone with laboratory experience knows, the dangers run less frequently to full-scale explosions than to noxious fumes, staining or corrosive damage to clothing and furnishings, chemical burns and irritations, and the accidental ingestion of toxicants. Secondly, do not hand a child a chemistry set and expect or even permit him to tackle it all by himself. Depending on how well he can read and follow directions, he may need a great deal of supervision or not very much. But at the very least be prepared to study the instructions yourself and to be close at hand when the set is in use.

So much for the idea that a chemistry set can or should start a child experimenting with unknowns after the fashion of a real laboratory scientist. Only under the direct guidance of a person with a competent knowledge of chemistry, should a child be permitted to design and carry out his own experiments—and thus be exposed to the undeniable fascinations of empirical inquiry.

Hazards within the law

Even while supervising a child who is willing and able to follow the instructions in his chemistry set, and whose set fully conforms to FDA requirements, you should keep alert for possible dangers. The manuals sometimes warn inadequately or not at all about certain kinds of hazards for which there appear to be no specific regulations under Federal law. Here are a few examples of potential pitfalls taken at random from the sets tested:

- Alcohol lamps, intended for use in experiments requiring heat and found in larger *Chemcraft, Gilbert,* and *Skil-Craft* sets, could quite easily leak onto work surfaces and clothing if mishandled. The highly volatile and flammable fumes could be ignited from the burning wick of the lamp or from a match with which the lamp was being lighted. A CU reader has, in fact, described an accident in which an exploding lamp severely burned two children. Furthermore,

a flexible blowpipe provided with some lamps to direct and intensify the flame could be a hazard to the face and eyes of the user if, for example, he turned the pipe toward himself in order to look at its flame.

▪ The rockets provided in the largest *Chemcraft* set and three of the *Skil-Craft* sets "launch" after expanding gas builds up enough pressure to "pop" them from their base. Both brands' instructions warn against pointing the rocket at anyone; nevertheless, a child may decide to take a close look at the projectile and then unexpectedly catch it in the face, perhaps even the eye.

▪ *Skil-Craft* experiments entitled "Making Milk" and "Making Cherry Jelly" and *Gilbert's* "Raspberry Jello" and *Chemcraft's* "How to Change Water to Milk"—all these neglect to state within the instructions for the particular experiment that the mock foods produced are inedible.

▪ A *Gilbert* demonstration of atmospheric pressure, involving sealing a one-gallon can after some water has been brought to a boil in it, does not state clearly enough that the screw cap must be left off the can until the heat has been turned off. Yet water allowed to boil in a sealed can might cause the can to explode.

▪ A *Chemcraft* experiment calling for the use of dry ice and alcohol suggests dropping a grape or some other item into this extremely cold refrigerant mixture and then, after a few minutes, plucking it out to observe its quick frozen state. There is no warning against plucking out the grape with bare fingers, however.

Obviously, then, a chemistry set must be a joint venture of parent and child, and the most sensible course might be to start with a set priced under $5. Either of the two *Remco* kits, at $1 each, offers something to the beginner. And the lowest-priced sets of the three major brands, at $3 or $3.50, are likely to bring hours of fun to a receptive child.

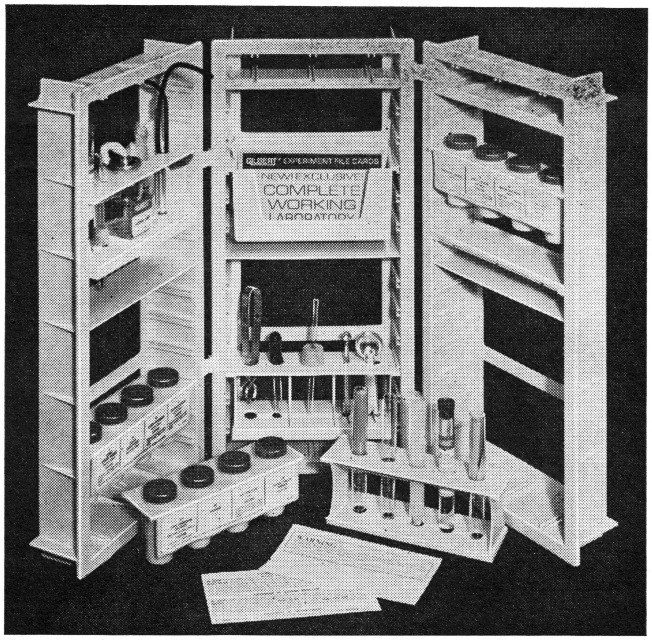
Each of the major brand's sets puts some emphasis on entertainment through magic. If a more diligently educational approach is desired, consider *Science Book-Lab, Chemistry.* Children who might be discouraged by the smaller print in other manuals will welcome the elementary typographical presentation in this one; and the subject matter was judged quite good by CU's consultants.

What if the child is fascinated by his introduction to chemistry and wants more experiments to do? In CU's opinion, the answer is probably *not* to buy him one of the higher-priced sets. It is true that these contain an increasing number and variety of chemicals and laboratory apparatus, but you also pay extra for make-believe equipment. For example, the weighing balances that all the expensive sets have are little better than toys, and, indeed, some manuals call for a balance in only a few token experiments.

CU's testers found, too, that the centrifuges provided were not much needed in the separation of materials and that the spinthariscopes furnished were not well suited to their purpose (which is to demonstrate radioactivity) because of their hard-to-observe effects.

What is most likely to disappoint an enthusiastic youngster, however, is that in some sets, certain of the experiments are simply repetitions of a single procedure—and sometimes the repetitions increase as the price goes up. Thus, a basic procedure in determining how much of a given chemical will dissolve in hot or cold water is repeated 22 times with various chemicals in the lowest-priced *Skil-Craft* set; the most expensive set of this line, with its greater selection of chemicals, repeats this exercise 64 times. The next-to-highest-priced *Gilbert* set suggests putting any 10

The multi-panel boxes for Chemcraft (here) and Skil-Craft sets tend to spill their contents each time they are opened



Gilbert Chemlab's slotted plastic frames hold things firmly, but the experiment cards (bottom) were judged poorly organized

of its chemicals through an analytical scheme of up to seven procedures, for a claimed total of 70 experiments; the highest-priced *Gilbert* set, by merely suggesting the use of any additional 15 chemicals of those supplied, boosts the claimed total to 175 experiments.

Once the child has exhausted the possibilities of a low-priced chemistry set, a sensible way to handle his enthusiasm might be to buy him the manual for the top-priced chemistry set (using the re-order blank enclosed in the less expensive set), help him to choose among the experiments in it, and then obtain the necessary chemicals and equipment from either a local laboratory supply house or directly from the chemistry set's manufacturer. The largest *Chemcraft* set, for example, comes with a multiplicity of manuals, leaflets, and charts of instruction. Among them is the "*Chemcraft* Master Manual" ($1.75), which CU judged to be well organized. It omits "magic" (leaving it to the "*Chemcraft* Magic Manual") and concentrates on experiments in academic and applied chemistry. "*Chemcraft* Glass Blowing and Construction of Laboratory Apparatus" (35¢) is another manual that might be found useful for an interested child. And the same may be said of the "*Skil-Craft* Advanced Chemistry Manual" (75¢).

Don't expect textbook accuracy from chemistry-set manuals, however. Sad to say, the explanations may in some cases lead to distorted concepts. Take, for example, the way the manuals of all three major lines explain why water rises in an inverted container—say, a jar—in which a candle is burning. The manuals attribute this phenomenon to a partial vacuum created by the removal of oxygen from the air inside the container as a result of combustion. However, the manuals do not point out the most important reason for the observed effect—namely, that the heat of the flame forces some air out of the container. When the candle has been snuffed out by the lack of oxygen, the remaining air cools off so that it contracts, and thus causes water to rise in the jar.

Fifty years after *Chemcraft* put out its first chemistry set, one might at least expect to find adequate packaging among chemistry sets. But CU encountered racks that spilled their contents, chemical containers that lacked warning labels or were difficult to use properly, boxes with sharp corners or without permanent covers.

Obviously, no one set will best suit every child, and none was free of shortcomings. But the following Ratings of the sets examined, with CU's notes and judgments, should at least take some of the grab-bag element out of shopping.

RATINGS OF CHEMISTRY SETS

Listed, within Acceptable and Not Acceptable groups, alphabetically with comments and judgments on manuals, packaging, equipment, and labeling. Prices are list; discounts may be available for many models.

Except as noted, all sets generally conformed with regulations under the Federal Hazardous Substances Labeling Act. Within the 3 major brand lines, the number of chemicals, pieces of glassware, and other supplies increases with price of set. Only the most significant equipment is listed. Number of experiments is listed as claimed by manufacturer (see story). The number of chemicals listed does not include seeds, logwood, duplicate bottles of chemicals, etc., sometimes counted by manufacturers. Alcohol lamps and rockets in all sets having them are judged hazardous (see story).

ACCEPTABLE

CHEMCRAFT (Lionel-Porter, Hagerstown, Md.). Manuals judged well organized and relatively unrepetitious. Chemical bottles well designed for solids but poorly designed for liquids. In one sample, calcium oxide did not have cautionary labeling. Packaging was judged inconvenient to work from or to use for storage.

BEGINNERS SET, Model No. 21310, $3.50. Instructions for more than 250 experiments. 7 chemicals. Paperboard box.

JUNIOR LAB, Model No. 21320, $6. Instructions for 325 experiments. 10 chemicals. Contents of *Beginners Set* plus alcohol lamp. 2-panel metal box.

STUDENT LAB, Model No. 21340, $10. Instructions for 450 experiments. 16 chemicals. Contents of *Junior Lab* plus weighing balance, judged flimsy but better than those in other brands. 3-panel metal box.

SENIOR LAB, Model No. 21360, $20. Instructions for more than 650 experiments. 23 chemicals. Contents of *Student Lab* plus blowpipe for alcohol lamp, judged hazardous (see story); centrifuge, judged good; spectroscope, judged good. 5-panel metal box.

MASTER LAB, Model No. 21380, $35. Instructions for 1000 experiments. 31 chemicals. Contents of *Senior Lab* plus rocket; agitator for test tube, powered by flashlight batteries (not supplied), judged fairly good; spinthariscope, judged adequate but effects were difficult to observe; hydrometer, judged poor because of faulty construction and inaccuracy; plastic buttons and washers and cardboard discs for constructing atomic models, judged adequate. 6-panel metal box.

CHEMLAB (A.C. Gilbert Co., New Haven, Conn.). Instructions for experiments on file cards were judged poorly organized and lacked table of contents. Chemical containers difficult to open. Plastic racks for test tubes were heat-softenable and therefore unsuitable for holding hot test tubes. Packaged in plastic storage frames, which can be secured to a wall or made to stand up when frames are connected by plastic hinges supplied with each set. Considered most adequate as a working console of the 3 major brand lines.

CHEMLAB 1, Model No. 12302, $3.50. Instructions for more than 300 experiments. 9 chemicals. 2 storage frames. Carton has no cover for dust-free storage.

CHEMLAB 2, Model No. 12303, $5.50. Instructions for more than 400 experiments. 13 chemicals. Contents of *Chemlab 1* plus alcohol lamp and blowpipe, judged hazardous (see story). 3 storage frames. Carton has no cover for dust-free storage.

CHEMLAB 3, Model No. 12304, $10. Instructions for 500 experiments. 20 chemicals. Contents of *Chemlab 2* plus weighing balance,

judged fair. 4 storage frames. Carton has no cover for dust-free storage.

CHEMLAB 4, Model No. 12305, $15. Instructions for 700 experiments. 27 chemicals. Contents of *Chemlab 3* plus plastic assembly for hydroponics (soilless gardening) experiments, judged good; mortar and pestle, judged good. 6 storage frames. Carton has cover.

CHEMLAB 5, Model No. 12306, $25. Instructions for 925 experiments. 30 chemicals. Contents of *Chemlab 4* plus battery-powered spin-type magnetic stirrer (batteries not supplied), judged fair-to-good; ring stand and support, judged poor. 8 storage frames. Carton has cover.

THE MAD MAD MAD SCIENTIST LABORATORY, MM 300 (Physio-Chem Corp., Westbury, N.Y.), $3. Instructions, lacking table of contents, for more than 100 experiments, many of a make-believe horror type. The minimal educational value in the experiments is further limited by the use of make-believe names for chemicals. 8 chemicals; full cautionary wording missing on some bottles, but all had statement, "Caution—do not take internally." Cautionary labeling also missing from carton and instruction manual, which even suggested, "Be sure nobody can see you when you work in your lab." Paperboard box judged inconvenient to work from but adequate for storage.

REMCO SCIENCE KIT, CHEMISTRY, Model No. 410 (Remco Industries, Inc., Harrison, N.J.), $1. Instructions for 13 experiments, mostly in magical context. 5 chemicals; well-labeled paper packets of solids but with no provision for reclosing. Outer carton and instructions lacked required Federal cautionary statement, but instructions did contain prominent warning about hazards.

REMCO SCIENCE KIT, ELECTRO CHEMISTRY, Model No. 413 (Remco Industries, Inc.), $1. Instructions and components for 9 experiments dealing with the simple assembly and operation of a galvanometer and various wet cells. Copper, zinc, and nickel electrodes unlabeled. Apparatus judged safe and adequate.

SCIENCE BOOK-LAB, CHEMISTRY, No. 1455 (Grosset & Dunlap, Inc., NYC), $3.95. Manual with instructions for 37 experiments, judged attractive and well organized. 6 chemicals; paperboard chemical containers judged poor because they tended to puff chemical dust at user. Calcium hydroxide did not have proper cautionary labeling. Paperboard and plastic compartment tray judged useful for storage if carefully unstapled from box and turned over.

SKIL-CRAFT (Skil-Craft Playthings, Inc., Chicago). Manuals judged generally well organized, but some experimental procedures grew increasingly repetitious in higher priced sets. Chemical containers judged well designed. Packaging was judged inconvenient to work from or to use for storage. Except as noted, outer cartons lacked required Federal cautionary statement.

INTRODUCTION TO CHEMISTRY, Model No. 500, $3. Instructions for more than 315 experiments. 8 chemicals. Foam plastic trays. Transparent cover of carton revealed cautionary statement on manual.

STUDENT CHEMISTRY, Model No. 502, $6. Instructions for more than 475 experiments. 12 chemicals. Contents of *Introduction to Chemistry* plus alcohol lamp. 2-panel metal box.

SENIOR CHEMISTRY, Model No. 506, $10. Instructions for more than 525 experiments. 15 chemicals. Contents of *Student Chemistry* plus balance, judged poor; rocket. 3-panel metal box.

ADVANCED CHEMISTRY, Model No. 510, $20. Instructions for more than 580 experiments. 23 chemicals. Contents of *Senior Chemistry* (except for rocket) plus blowpipe for alcohol lamp, judged hazardous (see story); centrifuge, judged poor; spectroscope, judged fair; plastic device for soilless gardening experiments, judged adequate; tri-pod, judged good. 4-panel metal box.

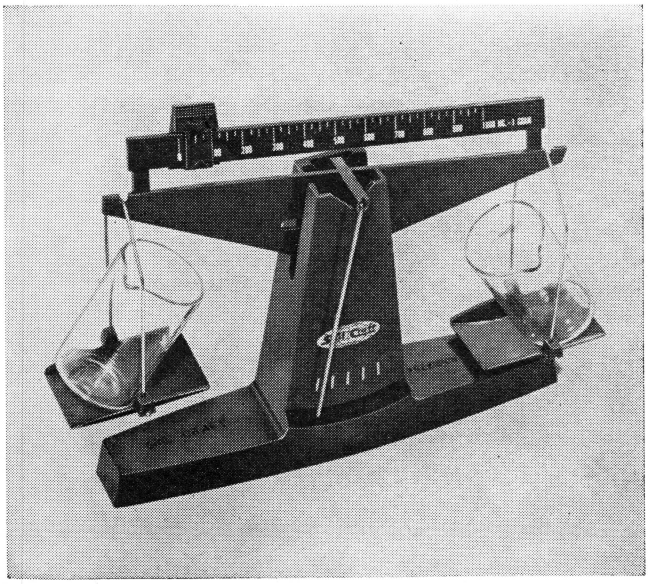
CAREER CHEMISTRY, Model No. 512, $30. Instructions for more than 730 experiments. 32 chemicals. Contents of *Advanced Chemistry* plus calibrated automatic dropper, judged good; rocket; spinthariscope, judged poor because effects were extremely difficult to observe and instructions for use were not included; atomic models, judged adequate. 6-panel metal box.

DELUXE CAREER CHEMISTRY, Model No. 515, $40. Instructions for more than 830 experiments. 41 chemicals. Contents of *Career Chemistry* plus battery-powered beater-type stirrer (batteries not supplied), judged good; mortar and pestle, judged fair. 6-panel metal box.

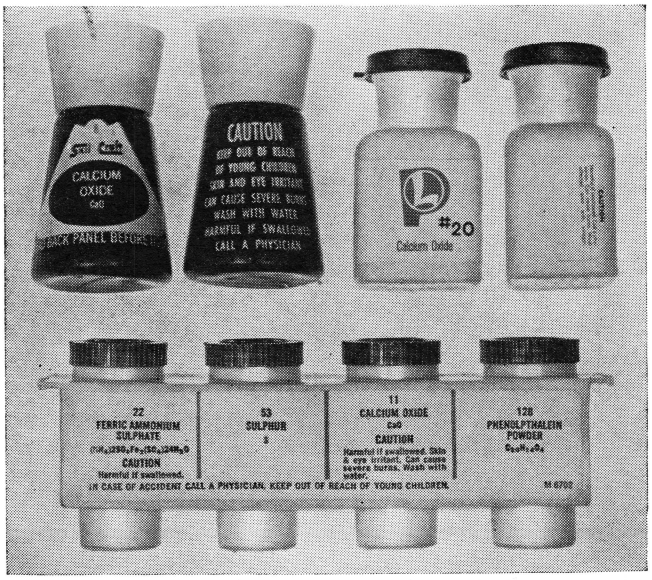
NOT ACCEPTABLE

HOMELAB ADVENTURES IN SCIENCE CHEM-SETS (Physio-Chem Corp.). All judged Not Acceptable because outer cartons, certain chemical vials, and instruction leaflets lacked required caution labels.

MAGIC IN CHEMISTRY, Model No. CP 51:100, $1.
CHEMICAL DETECTIVE, Model No. CP 52:100, $1.
EXPERIMENTAL CHEMISTRY, Model No. CP 53:100, $1.
THE RESEARCHER, Model No. CP 54:100, $1.



The Skil-Craft weighing balance was flimsy, and the beakers provided with the set are too large to be set properly on the two balance pans (as is suggested in the manual)



Skil-Craft (top left) and four-in-one Gilbert bottles carry proper cautions. Chemcraft (top right) didn't call attention to side-panels, or say "keep out of reach of young children"

Marine Speedometers

A GOOD GIFT IDEA FOR THE OWNER OF A POWER BOAT; MORE THAN A DOZEN MODELS WERE TESTED

Even at this off-season time of year, anybody on your Christmas gift list who owns a small cruiser or an outboard runabout might welcome one of the speedometers CU tested for this report. They range in price from about $6 to $25 or so for a complete system, and the best of them performed well enough to be suited to such fairly demanding tasks as indicating the speed of a boat that's pulling a water skier in competition or aiding in the kind of short-distance navigation that a small-boat owner might do. And even the lower-rated models (some of which are priced lower, too) may satisfy a boatman who wants to know the speed of his craft mainly "just for fun."

How they work

All the models CU tested employ a Pitot tube (named after Henri Pitot, an 18th-century French physicist), which senses the pressure of the water flowing under the boat. The Pitot pickup is installed below the waterline with its small hole pointed forward. Water entering this hole compresses the air trapped in the tubing that connects the Pitot tube with the speedometer head, and the increased air pressure is registered by the head mechanism—which is, in effect, a pressure gauge calibrated in miles per hour or knots.

One drawback to a Pitot-tube pickup is that the pressure of the air in the tube does not rise in direct relation to the boat's speed, but much faster—in proportion to the square of the speed. Hence, the dial calibrations can be evenly spaced only if the speedometer head mechanism is designed to compensate for this varying rate of pressure change. The speedometer heads of most of CU's models, which have what are known as Bourdon-tube movements, do not so compensate. The dial calibrations of these models do not begin until 5 mph and are bunched together at low speeds, so that in many instances they are almost useless below about 10 mph. Most power-boat owners, however, probably are not much interested in low-speed readings. For those who are, the project includes two models, both high-rated, with calibrations that are easy to read at every speed they cover. These two (both from Airguide's *Contralog* line) employ aneroid-type pressure-sensing elements so linked to the dial pointer that the calibrations are almost evenly spaced right around the dial—which, on these models, goes up to 30 mph (some dials go up to 45 mph).

Choice of a speedometer should certainly take into account the kind of boat on which it will be used as well as the particular purposes for which it is intended. Among the factors that must be considered are these:

PICKUP MOUNTING. Pitot-tube pickups come in two designs, one for mounting at the base of the transom and the other for installation through the hull. Airguide's *Contralog* models offer a choice between these two designs; the other models tested come equipped with a transom pickup only (although through-the-hull pickups are available for most of them at extra cost). On a small boat, a transom model is usually preferable because a through-the-hull mounting requires a metal tube that protrudes above the water line—a potential toe-stubbing obstacle. Such a mounting is also more difficult to install, and it's definitely undesirable for double-hulled glass-fiber boats, on which a convenient and watertight installation is very hard to achieve.

The drawbacks of a transom pickup are that its exposed position and its shape make it more susceptible to damage and more prone to catch weeds than a through-the-hull design; but, of course, it is comparatively easy to clear if it becomes blocked.

Whichever type of installation you choose, check the sample you are buying to be sure that the Pitot-tube opening is free from burrs or mold flash that might affect accuracy, and that the pickup housing does not have manufacturing defects (cuts or jagged projections, for instance) that would be likely to catch weeds. A transom pickup should be designed so that, reaching a hand over the stern, you can pivot it up out of the way (when the boat is being beached, for example) without too much effort. On the other hand, it should have a positive and unequivocal "down" position, because setting it at the wrong angle will affect the accuracy of the reading (as it did in the case of the *Airguide 850* pickup).

HEAD MOUNTING. The heads of most of the models were designed to be screwed onto any flat vertical surface, such as a dashboard. One model (*Aqua Meter 35 DM*) is shaped like an auto spotlight and is intended for mounting on a horizontal surface such as a deck or cowling. To install either of these two types requires no more than the minimum of skill, a drill, and a few simple hand tools. Another group of models, designed for mounting "flush" with the dashboard, requires more sophisticated tools (particu-

larly a circle cutter or expansive bit, to make a perfectly round hole of the precise size). Such a mounting may present some other problems, too.

The *Wico*, for instance, needs at least three inches of clearance measured from the face of the dash. And if the head is mounted on ¾-inch plywood (commonly used for bulkheads and dashboards), the legs of the *Wico's* mounting bracket must be shortened with a hacksaw. The mounting brackets of the *Aqua Meter 35 BC* and the *Sears Elgin 62704* are too narrow and have to be bent outward.

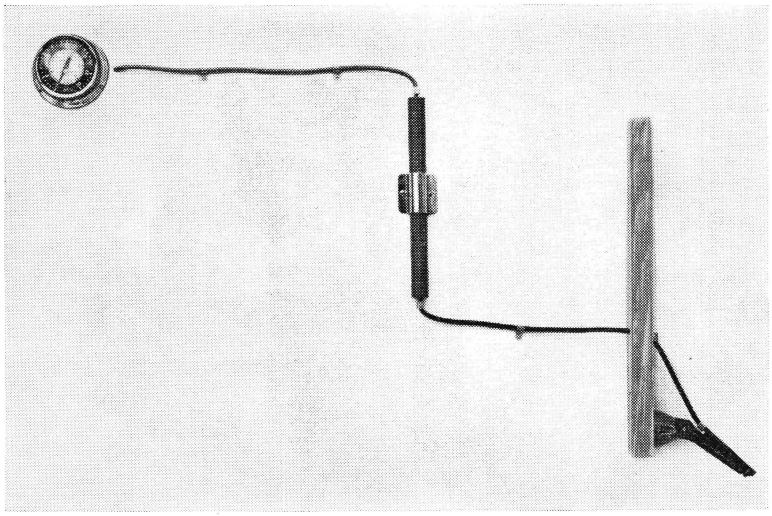
EXTRA FEATURES. One accessory available (at a dollar or two) for most of the models is a bleed valve, which vents the tubing that connects the Pitot tube to the speedometer head. Such a valve is not essential, but it can be handy on occasion. It is used to release the excess air that gets trapped in the tube when a boat is first put in the water—the pressure of this excess air will cause the speedometer to read high. This situation, which for many boatmen arises only once a season, can also be taken care of by removing the tubing from the speedometer head for a moment. But someone who trails a boat—and will therefore launch it many times during a season—might find a bleed valve convenient. In the kind of boat usually trailed, which draws only a few inches, the speedometer error attributable to air trapped in launching is small. But in a boat with a deeper draft the error can be significant—as much as 5 or 6 miles per hour for a boat drawing a foot of water. One drawback to a bleed valve is that if it is inadvertently opened while the boat is moving, water may flood the tube and damage the speedometer head.

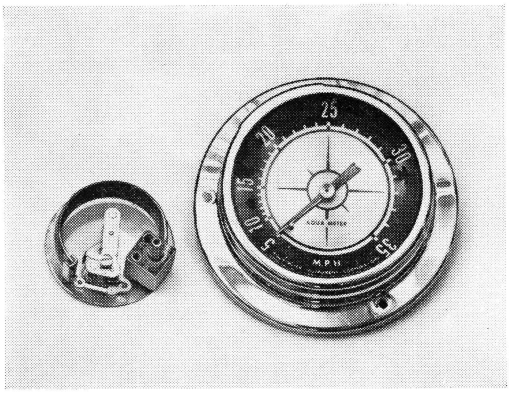
Another accessory, which comes with the pickup systems of some of the *Airguide* models tested, is a stabilizer tank, a tube about a foot long and an inch in diameter. It is spliced into the tubing that leads from the pickup to the head. At high speeds a stabilizer helps to keep the water from rising too far up the tubing, and in rough water it damps out some of the fluctuations in speedometer readings that are likely to arise from rapid changes in the depth of the pickup as the boat bounces on the waves.

Two features are available as standard fittings on some of the tested models. The first of these, a light for the dial, may be of little value, except for boatmen who often cruise at night. In any case, CU found that lighting fixtures tended to vibrate and to corrode and that changing the bulb sometimes necessitated dismounting the speedometer head completely. The other feature, offered by two of the *Airguide* models, is an adjustment screw for resetting the speedometer pointer to zero when necessary.

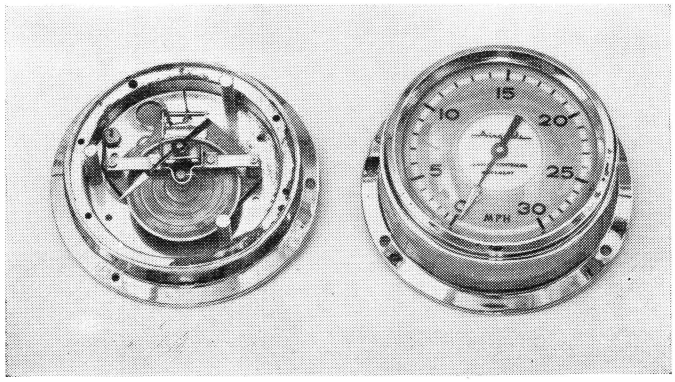
The basis of CU's Ratings

CU rated 15 models of speedometers, selected from among the under-$25 range of the leading manufacturers. The principal tests concerned accuracy. CU's consultants checked each model at 5 mph intervals during six test runs





The mock-up above shows a typical speedometer system using a transom-mounted Pitot pickup. Mounted between the pickup and head is a stabilizer tube, which minimizes needle fluctuations in rough waters



Most models had Bourdon-tube movements (above right), in which air pressure moves a curved tube that is linked to the pointer; dial markings of these models are crowded at the low end. In contrast, the aneroid movements (right), by a system of levers and chains, give dial markings that are nearly even in spacing and can be read down to low speed ranges

MARINE SPEEDOMETERS
continued

—three in which the speed went from 0 to 15 mph and then back to a stop, and three in which it went from 20 mph up to the maximum and then back to 20 mph.

The average inaccuracies of the individual test models over their full speed spans ranged from 0.5 to 2.2 mph, but some models registered very inconsistently. Certain ones were much more inaccurate at one speed than another, and in others the variations in error depended on whether a particular speed was reached when the boat was accelerating or decelerating. And some models gave quite different readings on successive trips over the same course.

CU's three top-rated models (all from the *Airguide* line) registered relatively consistently and showed no error greater than 1 mph (although, as noted, the *Airguide 850* was inaccurate if the pickup provided was set at the wrong angle—an easy mistake to make with that pickup). Samples of the fourth *Airguide* model, the *711*, performed less accurately than the others.

The next group of models—the *Aqua Meters* and their mechanically identical *Sears* and *Wards* counterparts—were downrated because their readings tended to be erratic. A few timed tests between charted buoys will disclose a speedometer's tendency to err, so that you can correct for it if the speedometer's readings are consistent at a given speed. It is good practice to retest a speedometer in this way from time to time because its accuracy may well be affected by use.

After the accuracy test runs, the speedometer heads were subjected to a 20-hour laboratory shock test designed as an approximation of the kind of repeated jarring and vibration that they might receive in a small boat pounding through rough water. As a result of this treatment, some speedometers ceased to operate, and some others became a lot less accurate. The performance of the *Airguide* heads was little affected, but they broke away from the board on which they were mounted for the test—so CU advises using either larger mounting screws for them than those provided or machine screws with lock nuts or lock washers.

The heads were then subjected to a salt-solution spray continuously for 48 hours (a Federal Standard test commonly used for marine and aircraft instruments). This test did not affect the models' accuracy despite some corrosion of their housings.

The results of these tests, plus the judgments of CU's consultants on the construction of heads and pickups, workmanship, and ease of installation, all contributed to the order of the models in the Ratings. Although the middle group of models performed less well than the top group and generally showed a greater susceptibility to shock, one of the relatively inexpensive instruments from this group might be a good buy if it is to be used in calm waters, where it will not be subjected to jarring and vibration, and if the likelihood of errors of a few miles per hour will not be important.

In conclusion, a word of caution to the sailor with a compass mounted in his boat: virtually all of the speedometers tested make use of some magnetic material in their construction. Therefore it would be wise, once a speedometer has been installed, to check the compass and adjust it if necessary.

RATINGS OF MARINE SPEEDOMETERS

Listed in order of estimated overall quality based on field and laboratory tests and engineering judgments. Unless otherwise indicated, speedometer heads have plated housings, Bourdon-tube movements, and dial scales with calibrations cramped at the low-speed end (see story), but lack provision for zero adjustment. Prices are list and, except as noted, include Pitot pickups for transom mounting, tubing, connectors, and the necessary accessories for installation. Discounts are generally available.

ACCEPTABLE

AIRGUIDE CONTRALOG 701 (Airguide Instrument Co., Chicago), $9.95 for speedometer head only. Aneroid barometer-type movement. Calibrated 0 to 30 mph in almost evenly spaced graduations. For surface mounting. 4 in. overall diameter; 3-in. dial face. Has zero adjustment. Workmanship, excellent; resistance to shock, good. Mounting screws judged too small (see story); replacement by larger size recommended. Overall accuracy and performance, good when used with either pickup listed below. According to the manufacturer, this model has been discontinued but may still be available in stores.

AIRGUIDE 21 Weedmaster Pickup System (Airguide Instrument Co.), $7.50. Includes Pitot-tube pickup for transom mounting, stabilizer tank, 20 ft. of tubing, connectors, and accessories for installation.

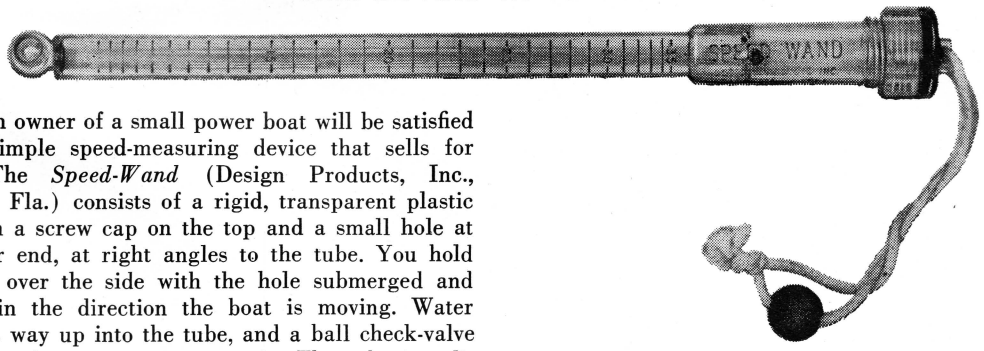
AIRGUIDE 19 Pickup System (Airguide Instrument Co.), $7.50. Pitot-tube pickup for through-the-hull installation on hulls up to 1 in. thick. Includes 2½ ft. of copper tubing, 8 ft. of plastic tubing, and accessories for installation.

AIRGUIDE SEA SPEED SPEEDOMETER SET 854 (Airguide Instrument Co.), $10.95. Calibrated to 45 mph. For surface mounting. 4-in. overall diameter; 3-in. dial face. 18 ft. of tubing. Workmanship, excellent; resistance to shock, good. Mounting screws judged too small (see story); replacement by larger size recommended. Overall accuracy and performance, good.

AIRGUIDE SEA SPEED SPEEDOMETER SET 850 (Airguide Instrument Co.), $9.95. Identical with *Airguide 854*, preceding, except for pickup. When pickup was set in a precisely correct position, this model gave good overall accuracy, but pickup had no positive "down" position and, when incorrectly set, was poor in accuracy. All other comments apply.

AIRGUIDE CONTRALOG 711 (Airguide Instrument Co.), $17.50. Speedom-

SIMPLE AND INEXPENSIVE



Many an owner of a small power boat will be satisfied with a simple speed-measuring device that sells for $4.95. The *Speed-Wand* (Design Products, Inc., Sarasota, Fla.) consists of a rigid, transparent plastic tube with a screw cap on the top and a small hole at the lower end, at right angles to the tube. You hold the tube over the side with the hole submerged and pointed in the direction the boat is moving. Water forces its way up into the tube, and a ball check-valve prevents it from running out again. The tube is calibrated from 5 to 35 mph. When you remove the tube from the water, the level of the water in it indicates the speed. You then loosen the screw cap, empty the water through a drain hole, and tighten the cap to be ready for the next speed measurement.

In CU's tests, the *Speed-Wand* was found to have fair-to-good accuracy. Its *average* error was only 1 mph; but its readings were relatively inconsistent, being in error as much as 4 mph at a speed of 35 mph. Nonetheless, you can get a reasonably accurate idea of your speed with the *Speed-Wand* by taking several readings and averaging them.

CU judged the *Speed-Wand* likely to be durable. It should have excellent resistance to the elements; indeed almost nothing in its simple construction can go wrong except that in time the engraved numbers may become less legible (a condition that is correctible by rubbing with a wax crayon and then wiping off the excess).

However, since the device is only 13 inches long and must be held over the side by hand to take a reading, it is suitable only for boats with a low freeboard in which this maneuver can be done with reasonable ease.

eter head only. Aneroid barometer-type movement. Calibrated to 30 mph in almost evenly spaced graduations. Has zero adjustment. For surface mounting. 5-in. overall diameter; 4-in. dial face. Workmanship, excellent; resistance to shock, good. Mounting screws judged too small (see story); replacement by larger size recommended. Overall accuracy and performance, fair-to-good when used with either of the pickups listed under *Airguide Contralog 701*, above. According to the manufacturer, this model has been discontinued but may still be available in some stores.

¶ *The following nine models tended to be more erratic than those preceding. All appeared to have identical operating components but differed in calibrated range, as noted, and the mounting provisions of the speedometer head. All came with 18 ft. of plastic tubing. Workmanship was judged very good; resistance to shock, fair.*

WARDS SEA KING Cat. No. 9206 (Montgomery Ward), $7.95 plus shipping. Calibrated to 45 mph. For surface mounting. 4-in. overall diameter; 3-in. dial face. Ease of installation judged excellent.

AQUA METER 4563 "Outboarder" (Aqua Meter Instrument Corp., Roseland, N.J.), $10.95. Similar to *Wards Sea King 9206*, preceding. All other comments apply.

SEARS ELGIN 62792 White Enameled (Sears, Roebuck), approx. $6.30 in retail stores. Similar to *Aqua Meter 4563* and *Wards Sea King 9206*, preceding, but case is finished in white enamel, which peeled and blistered during the salt spray test. Model is therefore not recommended for salt water use. All other comments apply.

AQUA METER 35 DM (Aqua Meter Instrument Corp.), $15.95. Calibrated to 35 mph. For deck mounting. 3-in. dial face. Ease of installation judged very good.

WARDS SEA KING Cat. No. 9237 (Montgomery Ward), $10.45 plus shipping. Calibrated to 45 mph. For surface mounting. 3-in. dial face. Housing designed for use with other instruments of same line; so *Add-On End Plates* (*Cat. No. 9240*, $1.59 plus shipping) are required if the speedometer alone is to be installed. Ease of installation judged good-to-very-good.

SEARS ELGIN Cat. No. 6334 Chrome Plated (Sears, Roebuck), $8.27 plus shipping. Calibrated to 45 mph. For surface mounting. 4-in. overall diameter; 3-in. dial face. Ease of installation judged good.

AQUA METER 35 SM (Aqua Meter Instrument Corp.), $12.95. Calibrated to 35 mph. For surface mounting. 4-in. overall diameter; 3-in. dial face. Ease of installation judged good.

AQUA METER 35 BC (Aqua Meter Instrument Corp.), $13.95. Calibrated to 35 mph. For flush mounting; requires 2 7/16-in. diameter hole. Stainless steel housing; 4-in. overall diameter; 3-in. dial face. Ease of installation judged poor (see story).

SEARS ELGIN 62704 (Sears, Roebuck), approx. $10 in retail stores. Calibrated to 45 mph. For flush mounting; requires 2 7/16-in. diameter hole. 3¼-in. overall diameter; 2⅞-in. dial face. Ease of installation judged poor (see story).

¶ *The following two models were judged seriously deficient in one or more aspects of performance and/or design, as noted.*

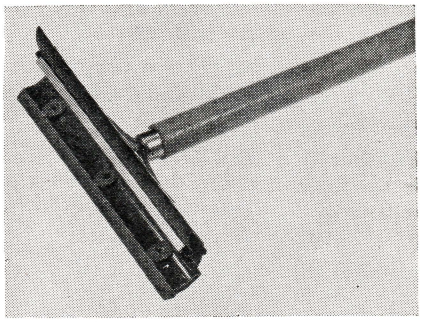
WICO OMS-545 Marine (Wico Div., Globe-Union, Inc., West Springfield, Mass.), $13.50. Calibrated to 45 mph. For flush mounting; requires 3⅜-in. diameter hole. 3¾-in. overall diameter; 3-in. dial face. Accuracy, fair-to-good. Mounting bracket required cutting to size and also clearance behind dash that would be excessive for some boats. Attaching tubing to head when bracket is in place, judged difficult.

TRUSPEED S-306 (Carpenter Corp., Muskegon, Mich.), $14.95. Calibrated to 45 mph. For surface mounting. Rectangular housing with plastic meter case; 4 in. high by 4¾ in. wide. Accuracy, poor. Unmeshing of gears during shock test destroyed calibration.

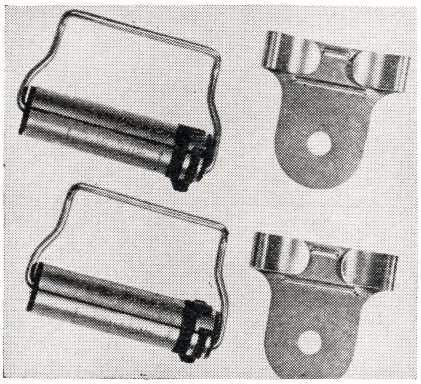
What to Buy for Car Owners

From the multitude of auto accessories displayed in catalogs, stores, auto supply houses, or dealer showrooms, CU's auto consultants have chosen some useful and inexpensive gift possibilities that can be installed without the assistance of a mechanic.

WINDSHIELD SCRAPERS of various types are widely promoted at this time of year. From several seasons' experience with it, CU's auto testers can recommend the *Scrape and Squeegee* (Inter-City Manufacturing Co., 2679 E. Grand Boulevard, Detroit). It is a substantial tool, with a 5½-inch plastic scraping edge on one side and a rubber squeegee on the other, making it useful for cleaning windows the year around. There is a choice of lengths for its wooden handle. The 12-inch size, a good compromise for adequate reach and reasonable storage in most cars, sells for less than $1.

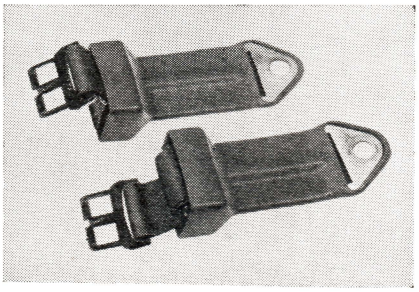


SEAT BELT RETRACTORS for the outboard half of each belt will keep the end from slipping out the open door, dragging over the muddy sill, or being damaged when the door is closed on it. But give only one retractor per belt: when retractors are used on both halves of a belt, it is difficult to tell in fastening the belt whether both retractors have been fully unwound. And if one of the springs still has some give in it, the belt won't hold someone down firmly in a crash situation.



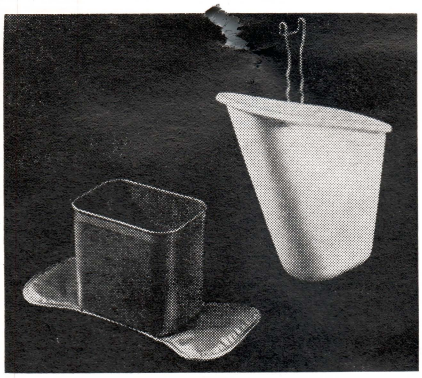
Retractors are as useful on rear-seat belts as on front belts, and rear belts will be standard equipment in 1966 cars. CU has installed, and found satisfactory, the Borg-Warner type of retractor (Borg-Warner Corp., South Bend, Ind.) shown here. It lists for $3.95 per pair.

SEAT BELT HOLSTERS make fitting companions to belt retractors, particularly in those cars in which the outboard belt half is anchored beside the seat. Holsters raise the belt off the floor and hold its end always in the same place, ready at hand. Since holsters, which cost about $3.50 per pair, are made to fit particular car models, the best source is probably a dealer for the car they will be used in. Each holster is installed by slipping it over the anchor end of the belt after it has been detached. A wrench will be needed.



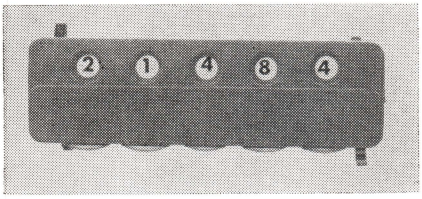
FUSEE FLARES, the type often used by state police, are the best choice if you want to give an emergency warning device. Although they may not look as elegant as some of the fancy blinkers, reflectors, and battery lanterns promoted as warning devices, the fusees provide excellent visibility, and several of the 30-minute size should be carried in every car. You should perhaps pass along a word of advice with this gift. Most warnings are displayed too close to a disabled car. The motorist in trouble should go back at least 50 yards to place the fusee—after turning on the car's winking lights and interior lights and removing all passengers to a safe distance. Fusees of the 30-minute size are priced at about 3 for $1 at discount houses and auto supply stores.

AUTO LITTER BASKETS do indeed help to beautify America. The weighted saddle-bag type that fits over the drive-shaft tunnel in front or rear stays in position well. It should be leakproof for maximum usefulness. We found the *Crest* (Crest Mfg. Co., Edgefield, S.C.) best finished among several examined. This brand is sold by General Motors dealers at about $2.50. We also liked



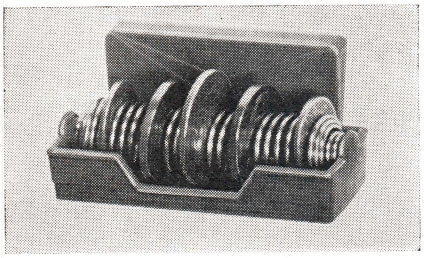
the *Coronado* litter container (Rubbermaid, Inc., Wooster, Ohio; about $1.50). This one has a larger capacity than the *Crest* and can be hung unobtrusively back under the right side of the dash on the kick-pad panel in the front compartment. Like the *Crest*, it is leakproof.

HANDY LITTLE MILEAGE RECORDERS are available at only 21¢ each, plus 70¢ handling (!) for any order up to $5, from J.C. Whitney Co., Archer Ave., Chicago. The 3x1-inch case contains five dials that let you set it to any five-digit number. It can be used to note



start-of-trip mileage, odometer reading when the gas tank is filled, or the mileage when the next servicing is required. It has clips for attaching it to the sun visor of the car.

COIN HOLDERS are useful gifts for anyone who regularly runs the toll gate gauntlet. Several models CU examined

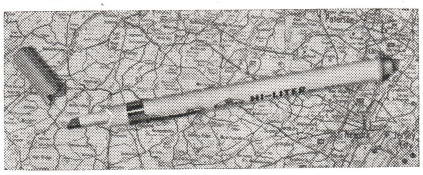


failed to meet all four desirable requirements: that they segregate different coins, require only one hand to operate, not cause injury if struck in a collision, and be easily demountable. Best of the lot is the kind that holds coins between the coils of a spring and attaches by a magnet to any steel surface. An example of this type is the *G-L Hold-a-Coin* (Glass Laboratories, Brooklyn, N.Y.; about 60¢).

THE HIDDEN KEY BOX is an old idea but still a good one. Basically, it's a small box big enough to hold an extra set of car keys, with a sliding cover and a magnet attached to the bottom.

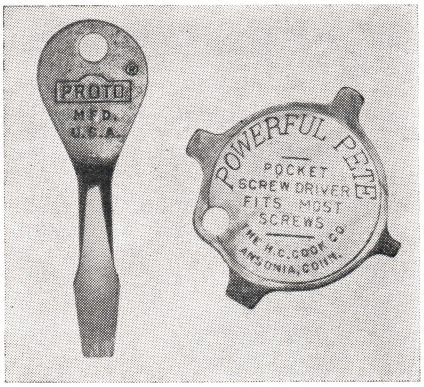
It can be placed on an uncoated metal surface, preferably horizontal, in a well-concealed spot under the car, or in the engine compartment if it is not locked from inside. The keys it holds can save trouble if the regular set of keys is lost or accidentally locked inside the car. Either the 50¢ *Hide-a-Key* or the 60¢ *Jiffy Secret Key* is satisfactory; both are available in many stores.

WATER COLOR MARKERS for someone who travels often in new territory will help him lay out his route on a map.



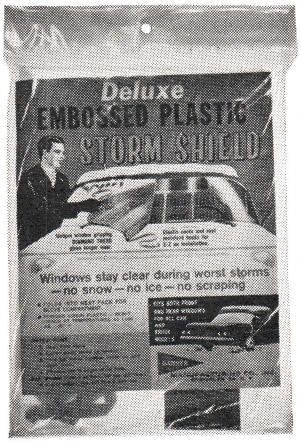
Many such markers make colored lines that are transparent and so do not obscure small towns and intersections. We found a yellow marker to be more transparent than either blue or red. One model that is easy to use and easy to carry, because it has a clip, is the 49¢ *Carter's Hi Liter* (Carter's Ink Co., Cambridge, Mass.).

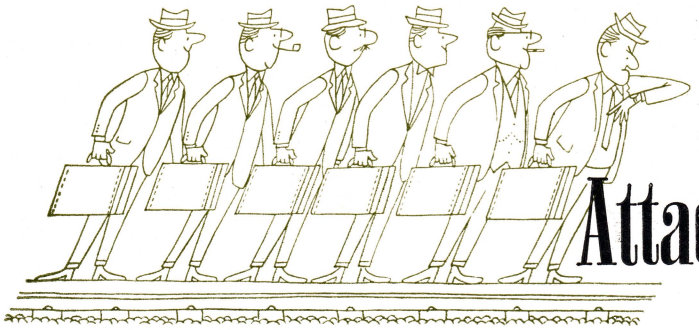
A SMALL SCREWDRIVER to hang on a key ring is a very welcome gift for the owner of a new car, to use in emergency tightening of the inevitable loose screws. Two good ones have come to



CU's attention. The *Proto* is a tiny, conventionally shaped driver with a single blade for slotted screws. It can be ordered from the Proto Tool Co., 2209 South Santa Fe Avenue, Los Angeles, for 50¢ plus postage. *Powerful Pete* (H.C. Cook Co., Ansonia, Conn.) is a round disk 1⅝ inches in diameter, studded with four different-sized blades. All are for slotted screws (although some are small enough for you to use on Phillips screws, too). It costs only 25¢ in drug or novelty stores.

A WINDSHIELD COVER of waterproof material, with clips to hold it on, might be appreciated by the man who parks his car outdoors while at work or at home. These covers can be obtained at many accessory stores for $3 or less.





Attaché Cases

CU RATED 21 MODELS AND COMPILED A PORTFOLIO OF TIPS ON SHOPPING FOR THIS POPULAR GIFT

The attaché case last year capped its rapid rise from diplomatic obscurity by overtaking the briefcase in output figures. Now, everywhere you look, you find it transforming scholars, office workers, and salesmen into Men of Affairs.

Before setting out to buy an attaché case as a gift, you might inquire discreetly what it will be used for so that you can select the appropriate size and fittings.

The 21 models tested for this Christmas Buying Issue encompass the three generally popular types: leather-covered, vinyl-covered, and molded plastic. Whenever possible a brown and a black sample of each model were included in the project. Length and width are fairly well standardized at 12x18 inches, give or take an inch or so each way, but the test models vary in thickness from about 3 inches (suitable for the morning paper and a fair assortment of documents) to a fairly fat 5 inches. An accordion file, fixed or removable, is attached to the lid (or top) of every tested model except the *Dopp 3A9246*, which instead comes with a removable portfolio. At $32.50 list price, this model is the second most expensive in the group and, like most others at the high end of the price range, is leather-covered. In general, molded-plastic models are middle-priced and vinyl models low-priced. Both types are almost always made to look like leather.

The leather and vinyl attaché cases are framed around the sides in wood. Around the opening of the case the wood is dovetailed for a tight closure. The vinyl or leather covering, or shell, is glued to a cardboard-like composition, and the composition is glued to the frame. The top and bottom of the case remain relatively soft and flexible. In some models these surfaces are padded with an underlayer of plastic foam or some other resilient material, giving a bit of extra protection to fragile objects inside, and cushioning against light scuffing.

By contrast, molded-plastic cases have no framing. The plastic shell gives the case its shape and most of its rigidity. And for reinforcement metal strips are placed around the edges of the lid and bottom. The strips dovetail to increase rigidity and to provide a seal against rain and moisture, and the metallic touch visually identifies these models.

CU's tests delved into durability, performance, and convenience. The attaché cases were rated for estimated overall quality regardless of type. Leather models took first and second place and pretty much dominated the top half of the Ratings, although several molded-plastic models also ranked high. The vinyl models consistently fell in the lower half of the list. Most makers of attaché cases apparently reserve their best workmanship, features, and construction for leather goods. Here, for a change, is a product in which higher quality often seems to accompany higher price.

It is still possible, however, to select a serviceable attaché case, and one well suited to be a gift, without paying a top price. Among the models tested, some fairly good ones list at around $20 or less. And there may be other cases worth considering in this range—CU could test only a best-selling handful of the several hundred models around. So CU's engineers kept an eye out for signs of good quality that shoppers might recognize for themselves.

Leather—no fair-weather friend

Although it may take a connoisseur to tell at a glance whether an attaché case is made of real leather, the genuine article will be readily distinguishable from the imitation after it's been used awhile. One of CU's tests simulated first light and then severe scuffing by means of a wire brush rotated at a set speed and applied at a set load against the surface of the cases. Under the equivalent of light scuffing against clothing, furniture and the like, vinyl and molded-plastic cases were virtually unblemished, while leather cases definitely began to look the worse for wear.

Leather wore its scars better than its imitators did, however, in the severe scuffing part of the test, which might be compared to an accidental hard scraping of the case against a surface such as the concrete or stone face of a building. On the vinyl cases the thin layer of vinyl finish, applied over a fabric or paper backing, was penetrated and torn away, leaving exposed a most unleatherlike wound. And hard scuffing sometimes revealed in the molded-plastic cases an underlayer of contrasting color. (At least, it did in almost all the brown samples; the black ones for the most part were black all the way through and therefore concealed their blemishes relatively well.) But leather, throughout its trials, went on looking like . . . leather.

So, though nonleather may stand up best to routine wear, real leather is more likely to grow old gracefully.

An attaché case is likely to be scuffed most often and most severely at its corners and edges. Some of the leather and vinyl models have their corners and short edges pro-

tected with metal strips (see Ratings), which should provide worthwhile reinforcement.

The inside top and bottom surfaces of the leather and vinyl cases are lined in order to cover the composition backing. Lining is not essential in molded-plastic cases, whose surfaces are smooth, but it is sometimes found in them anyway. Whether used functionally or for plush effect, linings should be durable. The best linings in the test samples were vinyl-coated fabrics. Vinyl film used alone or with a paper backing is much less serviceable.

The serviceability of an attaché case will also depend on the rigidity of its construction. Try bending the lid of a case against its hinges just enough to tell whether it seems comparatively flimsy. If it does, the hinges and lid-opening stays may eventually bend out of shape, putting the top and bottom out of line. The gap along the hinged edge when you open the case should be covered with a flexible lining to prevent pens and pencils from jamming it—another potential cause of hinge and frame damage.

Keeping water out

When the top and bottom edges of a case no longer line up properly, they may fail to seal out the rain. But even a new and unabused attaché case may not be watertight. CU's rain penetration tests turned up a number of samples with leaks along the handle side of the case—the side carried skyward. The fault seemed to lie in poor workmanship; hinges or latches were improperly positioned, and even a slight misplacement can create a serious leak.

Because occasional samples of any model might be subject to such flaws as these, CU did not downgrade the models that had a leaky sample. But the lesson for the shopper is to make sure the edges of a case come together evenly and latches close the lid tightly.

Most of the hardware on attaché cases seems designed for larger luggage. This is all to the good because an attaché case is probably going to be used almost every work day, and its hinges, latches, and stays can be expected to get constant exercise. Latches in particular will have a hard life. Some attaché cases use the spring-open latch; others are equipped instead with sliding latches or latches of some other types. All latches on the attaché cases tested were judged to have a reasonably adequate life expectancy.

The handles, too, on the models tested were judged to be more than stout enough for their task. Some, however, were attached to the case by means of substantial metal prongs anchored to metal plates inside the case, whereas others were merely stapled to unreinforced areas. Although no handle broke loose in CU's tests, the more rugged type of attachment was judged preferable. Keep in mind, too, that handles come in varying sizes, shapes, and materials. When it is feasible—as it may not be in gift buying, of course—the user should try the handle for comfort.

Steady does it

An attaché case can be downright exasperating to use if it tends to tip over every time you try to work out of it, or every time you set it down, as you would an ordinary suitcase, with the handle side up. Although the stability of the case will depend to some extent on its thickness and the load inside, stability is also a factor of design.

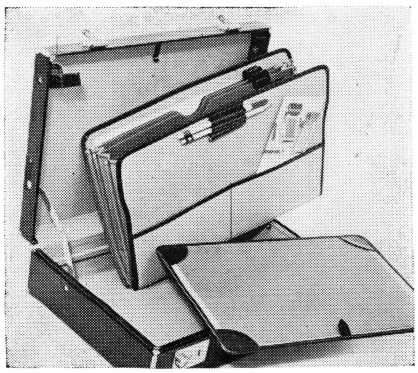
When its lid is fully open, an empty case should sit firmly. Many of the molded-plastic cases tested were endowed with convex bottoms—and wobbled accordingly. On this score the *Dopp 3A269* and *Samsonite Commuter* were especially praiseworthy exceptions. The stays (preferably two rather than one) should lock the top in place at a 90° angle; any bigger angle will create a tendency for the case to tip over backwards, and any smaller angle may bring the lid down on your fingers should the stays ever weaken.

When closed and set handle up, any attaché case is likely to be a pushover in comparison to a suitcase. A thicker case will obviously be more stable than a thinner one, but among models of similar thickness the way the feet (or studs) have been designed and placed can add to or detract from stability. A little experimental pushing in the store will reveal any really unsteady model.

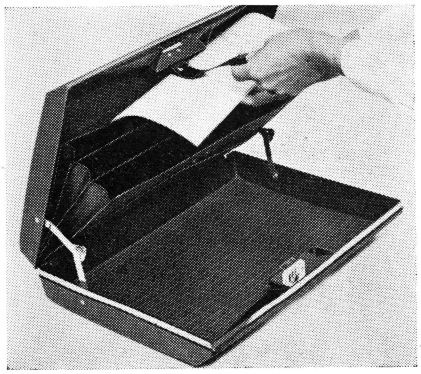
Accordion files

The files in the lids of most of the tested models have four or five pockets, each large enough to hold 8½x14-inch legal-cap documents. The storage capacity of a case may at times be more useful if the file is removable. Furthermore, as CU's tests demonstrated, a not very hard pull on an attached file can sometimes be enough to tear it loose.

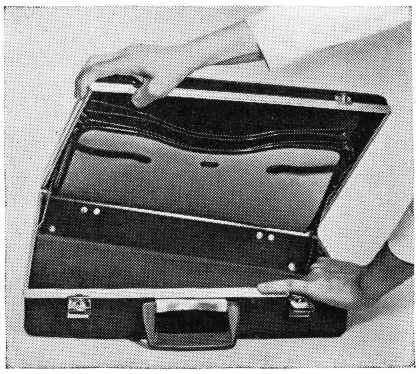
You can compare file capacities by measuring the width



Handy though they may be, an accordion file and desk should be removable to make room for thick books or other bulky things



Straps hanging down from the lid got in the way of filing; in the Jettaché, above, the latch also obstructed entry to the file



It was easy to tell, by tugging diagonally, whether a case was rigid enough to withstand forces that might misalign its lid

ATTACHE CASES continued

of the file's floor fully expanded. You can—and should—also compare bulkiness, for the bulkiness of some files may be out of line with their capacity. An empty file, of course, should take up as little space as possible.

The top edges of the file dividers are sometimes tiered and usually scalloped for convenient reference to the contents. But occasionally, as in the *Sears 487*, the edges are belligerently sharp at the scalloped corners. Index tabs on the dividers would seem to be of minimal use. If provided, they ought to be removable.

To keep the contents of the file from spilling out, the lid of every case was equipped with some sort of file retainer. The best kind, in CU's judgment, consists of straps attached to both sides of the lid, where they won't get in the way of the mouth of the file. Preferably, these straps should snap in either of two positions—for holding the file when it is fully loaded and when it is partly loaded or empty.

Some of the attaché cases tested come equipped with a framed blotter-covered writing surface mounted on a rigid composition board. This accessory, often called a "desk" in the advertisements, rests on flanges inside the case so that you can write with the case open on your lap. It may come in handy, especially during travel; however, the desk divides the case into two separate compartments, reducing the flexibility of the storage capacity and preventing the storage of many bulky objects. Therefore, a desk ought to be removable.

A little wiping with a damp, soft cloth now and then will ordinarily keep an attaché case looking clean. For stubborn dirt on vinyl or molded plastic, try mild soap and water. A leather preservative treatment once in a while is good for keeping leather cases soft and water-repellent. Put a drop of oil on the hinges and locks once a year, too, and if you notice that the file is starting to tear away from its backing under the lid, glue it back down at once and try not to load it too heavily from then on. Oh, and one more thing: various chemical solvents can mar the finish of most attaché cases. Even a slosh of martini may leave its lasting mark—so take care when mixing business with pleasure.

RATINGS OF ATTACHE CASES

Listed in order of estimated overall quality based on laboratory tests and judgments of durability, performance, and convenience. Differences in overall quality between adjacent models were judged slight; thus, selection may be based on a model's individual characteristics rather than its exact position in the Ratings, which therefore list features that might influence choice. Colors available are given as stated by the manufacturer. All models are between 17 and 18 in. long and between 11 and 13 in. wide, and the file compartments will hold legal-sized papers (8½x14 in.). Prices are list; except for mail-order brands, substantial discounts are widely available.

ACCEPTABLE

REXBILT E445D (Rexbilt Leather Goods, Inc., Brooklyn, N.Y.), $36. Leather. 5 in. thick, with metal protectors along the 4 short edges. 6.8 lb. Black, ginger, olive, suntan. More stable when closed and in handle-up position than most other cases of comparable thickness. Removable file: relatively small capacity; 5 pockets with permanent index tabs, nonadjustable strap; pencil straps and additional flat pockets for tickets, credit cards, etc., on front file panel. Removable desk. Also available as *E445F*, $36 (not tested), with no desk.

MUTUAL BRF 1 (Mutual Brief Case Co., Inc., Newark, N.J.), $25. Leather. 3 in. thick. 4.9 lb. Tan, olive, black. Less stable when closed and in handle-up position than most other cases of comparable thickness. Padded surfaces. Relatively large handle. Nonremovable file: 4 file pockets with removable index tabs.

DOPP 3A269, THE "TITAN" (Charles Doppelt & Co., Inc., Chicago), $18.50. Molded plastic. 4½ in. thick. 3.9 lb. Charcoal, olive. More stable when closed and in handle-up position than most other cases of comparable thickness. Resistance to scuffing above average for a molded model. Inside hinge edges not covered (see story). Nonremovable file: 5 file pockets. Unlined.

SAMSONITE 3" COMMUTER (Shwayder Bros., Inc., Denver), $24.95. Molded plastic. 3 in. thick. 5.8 lb. Tan, ginger, black, olive, gray. Nonremovable file: 3 file pockets. Only one key supplied. More stable when closed and in handle-up position than most other cases of comparable thickness. Judged more rigid than most other molded models tested. Also available as the *5" Diplomat*, $29.95 (not tested), 5 in. thick with 4 file pockets and a removable desk; and as the *2" Statesman*, $24.95 (not tested), 2 in. thick with 1 file pocket.

DOPP 3A9246 (Charles Doppelt & Co., Inc.), $32.50. Leather. 3½ in. thick. 5.4 lb. Suntan, black. Resistance to scuffing slightly better than average for leather models. Inside hinge edges not covered (see story). No file, but removable envelope-type leather portfolio, with separate key, under the lid. The metal retainer for this portfolio has been superseded by a leather one, judged somewhat less secure; with leather retainer, model would be two positions lower in Ratings. Cases with the metal retainer may still be available in some stores.

LION A734 (Lion Leather Products, Inc., NYC), $30.75. Leather. 5 in. thick. 4.8 lb. Suntan, ginger, black, olive. Padded surfaces. Nonremovable file: 6 file pockets with permanent index tabs; additional flat pocket for tickets, credit cards, etc., on front file panel. Top and bottom surfaces more flexible than those of most other leather models. Also available as *A733*, $28.65 (not tested), 4 in. thick.

STEBCO JETTACHE (Stebco Products Corp., Chicago), $24.95. Molded plastic. 4 in. thick. 4.7 lb. Charcoal, olive, metallic bronze. More stable when closed and in handle-up position than most other cases of comparable thickness. Resistance to scuffing above average for a molded model. Nonremovable file: 4 file pockets; filing judged relatively inconvenient; additional flat pockets for tickets, credit cards, etc., on front file panel. Unconventional design and shape; case was easily tipped over with lid open. Combination lock, could be easily pre-set to any 3-digit combination. According to the manufacturer, this model is now equipped with a "push-button lock" instead of the combination lock (not tested).

ALMCO 1FR (Atlantic Luggage Mfg. Co., Inc., NYC), $27.50. Leather.

3½ in. thick. 5 lb. Ginger, suntan, black, olive. Less stable when closed and in handle-up position than most other cases of comparable thickness. Relatively large handle. Removable file: relatively small capacity; 6 pockets with removable index tabs; additional flat pocket for tickets, credit cards, etc., on front file panel. Available as *1FRD*, $29.75 (not tested), with removable desk.

LEATHERCRAFT CA-5 (Leathercraft, Inc., Chicago), approx. $30. Leather. 3½ in. thick. 5.1 lb. Suntan, ginger. Relatively large handle. Nonremovable file: 3 file pockets; relatively small capacity; nonadjustable strap.

LEATHERCRAFT SA65 (Leathercraft, Inc.), approx. $16. Molded plastic. 3⅝ in. thick. 4.3 lb. Olive, black. Nonremovable file: 3 file pockets; greater than average capacity; nonadjustable strap; flat pockets for tickets, credit cards, etc., in front file panel. Case was easily tipped over with lid open. Judged more rigid than most other molded models. Unlined bottom.

REXBILT E333 (Rexbilt Leather Goods, Inc.), $24. Leather. 3 in. thick. 4.7 lb. Black, ginger, olive, suntan. Nonremovable file: 3 file pockets; relatively small capacity; nonadjustable strap.

MUTUAL M1 (Mutual Brief Case Co., Inc.), $15. Molded plastic. 5 in. thick. 5 lb. Tan, olive, black. Nonremovable file: 4 file pockets. Case was easily tipped over with lid open. Lining not fabric-reinforced. Also available as *M2*, $16.50 (not tested), with removable portfolio; and as *M3*, $18.50 (not tested), with removable portfolio and removable desk.

LIFTON No. 440 (Lifton Mfg. Corp., NYC), $27. Leather. 3¾ in. thick. 5.1 lb. Black, suntan, ginger, olive. Only one lid-opening stay. Nonremovable file: 5 file pockets with permanent index tabs; relatively small capacity; pencil straps on front file panel. Also available as *No. 441*, $29 (not tested), 4¾ in. thick; and as *No. 462*, $32 (not tested), with what manufacturer describes as "functional divider over bottom section."

LION A-507 (Lion Leather Products, Inc.), $15. Vinyl. 4½ in. thick. 4.6 lb. Suntan, ginger, black, olive. Nonremovable file: 5 file pockets. Lining not fabric-reinforced. Also available as *A-508*, $16.50 (not tested), with removable desk; and as *A-512*, $12.75 (not tested), 3½ in. thick.

CARLTON 7-301 (Carlton Case Corp., Div. of Rexbilt Leather Goods, Inc.), $16. Vinyl. 3 in. thick, with metal protectors along the 4 short edges. 4.3 lb. Charcoal gray (caviar), olive brown (teak), and suntan. Resistance to scuffing below average for vinyl models. Padded top surface. Nonremovable file: 3 file pockets; relatively small capacity; nonadjustable strap; attachment of file compartment to lid relatively weak. Also available as *7-225*, $17 (not tested), 4 in. thick.

STEBCO TUFIDE 20-A-17" (Stebco Products Corp.), $15. Vinyl. 3½ in. thick. 4.7 lb. London tan, black, British brown. Resistance to scuffing below average for vinyl models. Inside hinge edge not covered (see story). Nonremovable file: 3 file pockets; relatively small capacity. Also available as *Softone Tufide* (charcoal, olive green, coffee brown), $17 (not tested).

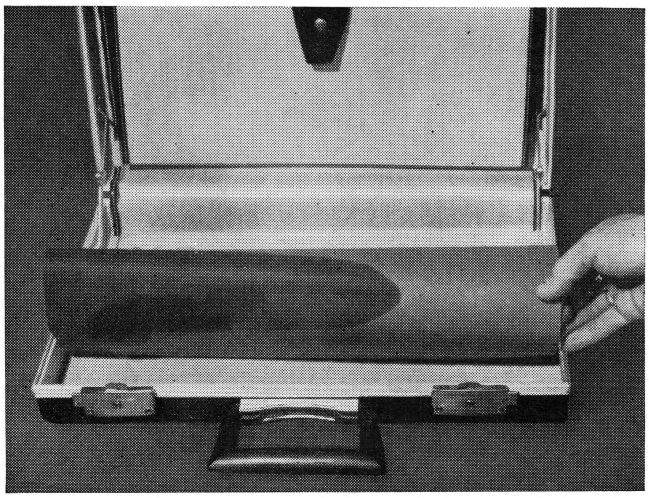
LIFTON No. 449 (Lifton Mfg. Corp.), $16. Vinyl. 4¼ in. thick, with metal protectors along the 4 short edges. 4.6 lb. Black, suntan, ginger, olive. Only one lid-opening stay. Nonremovable file: 5 file pockets; relatively small capacity. Also available as *No. 448*, $15 (not tested), 3½ in. thick; and as *No. 466*, $15 (not tested), 2½ in. thick with 4-pocket file.

ALMCO 3F (Atlantic Luggage Mfg. Co., Inc.), $12. Vinyl. 3½ in. thick. 3.9 lb. Ginger, suntan, black, olive. Less stable when closed and in handle-up position than most other cases of comparable thickness. Only one lid-opening stay. Nonremovable file: 5 file pockets; additional flat pocket for tickets, credit cards, etc., on front file panel. Lining not fabric-reinforced. Also available as *3FR*, $13 (not tested), with removable file, and as *3FRD*, $15 (not tested), with permanently attached desk (see story) and removable file.

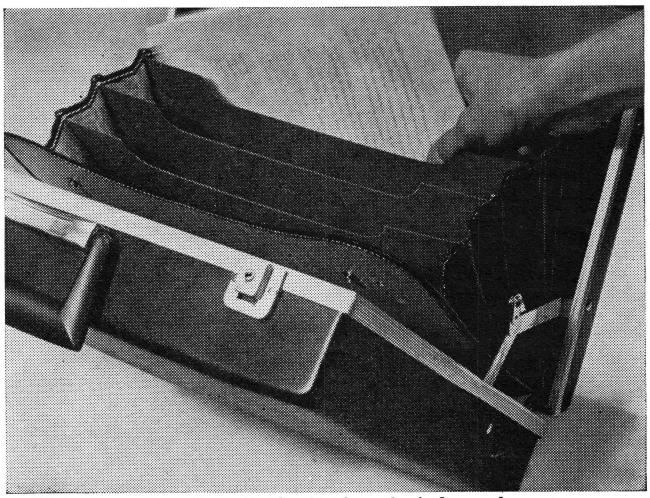
WARDS Cat. No. 4501 (Montgomery Ward), $13.49 plus shipping. Vinyl. 5 in. thick, with metal protectors along the 4 short edges. 5.7 lb. Black (*Cat. No. 4501-599*) and suntan (*-570*). More stable when closed and in handle-up position than most other cases of comparable thickness. Only one lid-opening stay. Nonremovable file: 4 file pockets; filing judged slightly inconvenient; attachment of file compartment to lid relatively weak. Lining not fabric-reinforced.

SEARS Cat. No. 9090 (Sears, Roebuck), $13.97 plus shipping. Vinyl. 4¾ in. thick, with metal protectors along the 4 short edges. 5.7 lb. Coppertone (*Cat. No. 9090-E*), medium tan (*-2E*), and black (*-3E*). Only one lid-opening stay. Nonremovable file: 4 file pockets; relatively small capacity; additional flat pockets for tickets, credit cards, etc., on front file panel; attachment of file compartment to lid relatively weak. Permanently attached desk (see story).

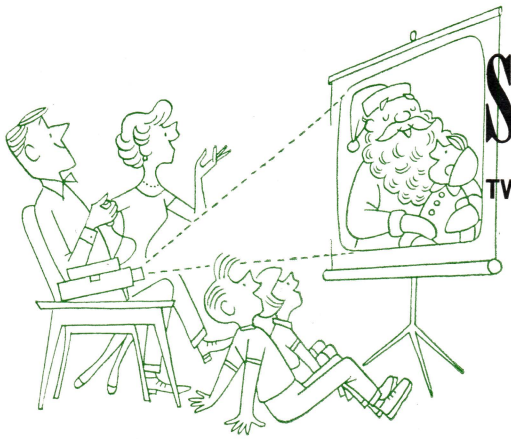
SEARS Cat. No. 487 (Sears, Roebuck), $8.87 plus shipping. Molded plastic. 4 in. thick. 3.5 lb. Black (*Cat. No. 487-0E*), ginger (*-1E*), and olive (*-2E*). Nonremovable file: 5 file pockets; painfully sharp divider edges; ends of vertical seams in file compartment not secured —seams therefore more likely to come undone. Case was easily tipped over with lid open. Judged less rigid than most other molded models tested. Lining not fabric-reinforced. Top and bottom surfaces more flexible than those of most other models tested.



In CU's water penetration tests, leakage left this soaked area on a blotter placed in what proved to be a poorly aligned case



Make sure the edges of file dividers don't have sharp corners like these on the Sears 487, which actually cut a tester's hand



Slide Projectors

TWENTY-SEVEN 500-WATT MODELS FOR 2-INCH SLIDES ARE RATED

Most of the widely available 500-watt projectors for the popular 2-inch slides are rated here, in time for both the Christmas shopper and the family photographer who wants to show his record of the festivities as soon as he gets the slides. Two-inch slides include those made from 35mm, 127, and 126 film sizes. CU's tests revealed that, though all the machines would project an at least satisfactory picture in most circumstances, they varied widely in design, convenience features, and other factors.

Current models are a far cry from the old projector that required each slide to be hand-fed into its innards. Slides are now loaded in advance into a tray or into a stack loader, and the operator pushes a button or moves a lever to withdraw one slide and insert the next for projection. Some models can use either a stack loader or one of several trays (also called magazines); see pages 564 and 565.

Other convenience features found on various models include remote controls of different degrees of versatility, slide timers for fully automatic feed, provision for feeding two trays in tandem (for a longer uninterrupted show), built-in viewers or viewing screens, built-in outlets for automatically turning a room lamp on and off, and dimmers to conserve projection-lamp life.

The models CU rated range in price from about $38 to $145 and have lenses of 4-inch focal length, except for two tested with 5-inch lenses because they do not come with 4-inch lenses. Note that some models offer a choice of lens focal lengths.

To provide as much rating information as possible and yet meet the publication deadline for the Christmas Buying Issue, CU selected for testing the most de luxe projector from each of several model lines. Then, if the manufacturer's literature indicated that a less de luxe model was basically the same as the model tested, differing only in specified convenience features, that model was rated on the basis of test data for the top-of-the-line model in combination with the manufacturer's information on convenience features.

Picture quality generally good

In testing, CU's engineers judged the quality of the projected pictures, the safety of the machines, and the ease of operating and maintaining them. For all the tested models sharpness was judged at least good with glass-mounted slides. Above this level differences in sharpness did exist, and in some instances between samples supposed to be optically identical. But these would probably have been imperceptible if CU had used cardboard-mounted slides, for transparencies in such mounts are usually not very flat and thus could have reduced sharpness enough to cancel out the differences found. Hence, picture sharpness was not a factor in rating the machines.

The brightness of the image they projected on a 40-inch screen was also judged quite adequate for all the projectors. However, if you plan to try filling a 60-inch screen with a standard 35mm slide, or if your projector will be used frequently in a not completely darkened room, you might consider one of the five models that provided a little more brightness than the others; the highest-rated of these is the *Airequipt Avventura 380.*

The uniformity of brightness was judged at least good in all the models when they were projecting 35mm slides, but with Super-Slides (from 127 film) a few showed pronounced darkening of the corners. In this respect models with supposedly the same optical systems again varied somewhat. So, when you shop, take along an empty slide mount of the largest size you plan to show and, if possible, project it with the particular machine you intend to buy to see whether the screen image shows more than minor variations in brightness over its area. Or buy your projector with an exchange privilege and check at home.

Convenience—the big difference

Among the models tested, the greatest differences were found in convenience of operation. On over half of the projectors, you need only press a pushbutton to return a projected slide to the magazine and position the next slide for projection. Not quite so easy, but still judged convenient, is the pull-push type of changer used on all the other models except the *Bell & Howell Headliner Model 710-EXP,* whose pull-turn-push mechanism was judged somewhat less convenient than the rest.

You may want to go back to a slide already shown. With most of the projectors that have trays, you merely put the feeder mechanism into reverse. With a few, however, you must push the tray back by hand, and with those that have stack loaders (built into the *Kodak Readymatic* and the *Airequipt Autostacks* and available for the *Sawyer's*

models), you are obliged to retrieve the desired slide by hand and put it in place to be shown again.

You may accidentally position a slide upside down, on its side, or backwards in the tray or stack loader. Most of the projectors provide for easy reorientation of such a slide, but with a few either the tray has to be removed or the slide must be rescued by hand from the stack loader. Most of the models also make it convenient to project a new batch of slides and to arrange them in the desired order. But the stack-loading units were less helpful here, and a number of models, noted in the Ratings, could not be used for this purpose at all.

Removing a jammed slide was judged most convenient with the *Anscomatics*, the *Kodak Carousels*, the *Sawyer's Rotomatics*, and the *Sears Tower*. Clearing a jammed slide from the *Airequipt Avventuras*, the *Airequipt Sprite 25*, and the *Sears 26* was judged much harder.

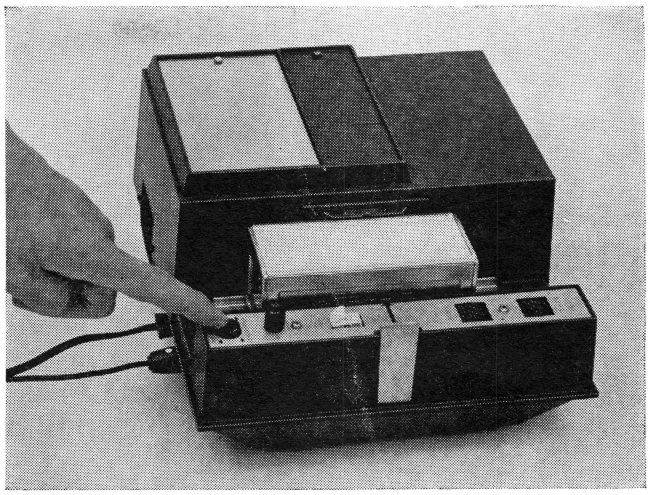
Several projectors have built-in screens, which although small, may sometimes be useful for an audience of one or two people. Both the *Argus 541* and *538* have a 5¾x6¾-inch screen on the underside of the projector top; the *Kodak Readymatic* and the *Bell & Howell Headliner Model 710-EXP* have larger screens (9x10¾-inch and 10¾x11-inch) inside their covers, but the 4- or 5-inch depth of the covers, which partially shield the screen from ambient light, interferes with viewing from the side.

Remote controls, where provided, were found to differ a good deal in versatility. The most versatile not only change a projected slide for the next in order, but can also return to a previously shown slide, focus, and project a pointer on the screen. The least versatile controls can't return to a previous slide or focus or project a pointer.

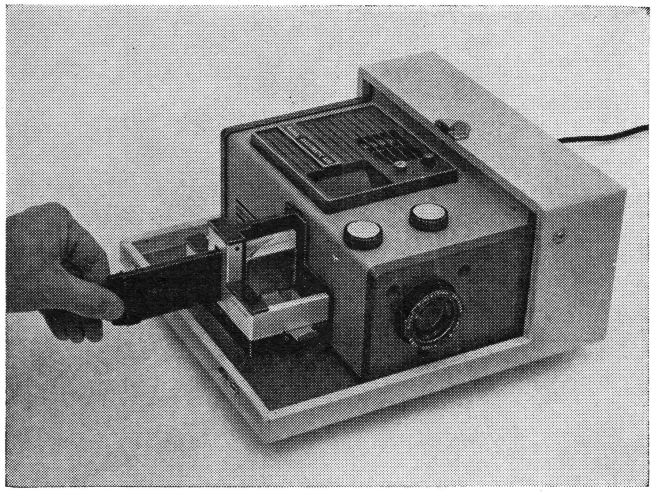
Most of the projectors also provide a switch to turn off the lamp and the fan, or the lamp only (for rapid cooling), but with some models lamp and fan stay on as long as the cord is connected to a live wall outlet. The *Anscomatic* models and the *Sears Tower Cat. No. 9888K* all have a built-in outlet for a room lamp; when the projector lamp is switched on, the room lamp goes off and vice versa. The *Kodak Carousels*, the *Anscomatic II*, the *Sears Tower*, and the *Argus Electromatic 573* and *570* have illuminated control panels, which may be useful at times.

Since a 500-watt projector provides brightness to spare in many situations, it is often possible to get satisfactory projection with less brightness. The *Kodak Carousel 800* and *700* take advantage of this fact, providing dimmers that reduce the voltage to the projection lamp. Eastman Kodak claims that lamp life will be quadrupled if the reduced voltage is used exclusively. The lamps of these models list at more than $6 each and have a rated life of only 25 hours; so use of the dimmer can make for substantial savings. Moreover, dimming the *800* and *700* gave pictures a somewhat warmer coloring. The adjustable iris diaphragms on the *Anscomatic II* and the *Sears Tower* also are intended to cut down picture brightness—but with no resulting increase in lamp life or change in color.

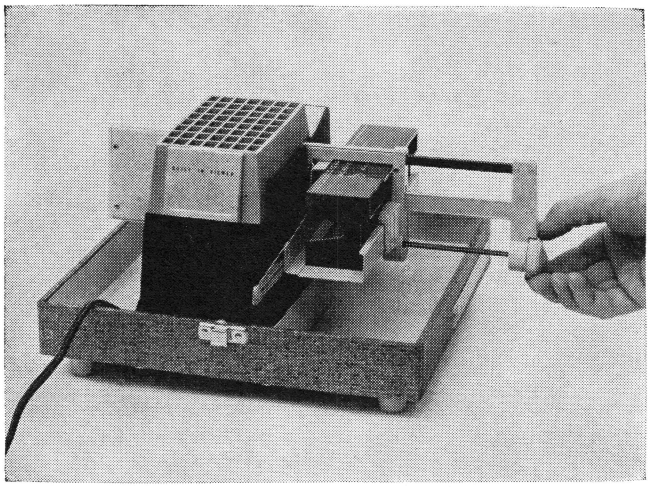
You should be able, with safety and reasonable ease, to carry a slide projector about, to replace its lamp if need be, and to give its lens an occasional cleaning. All the models rated have a carrying handle on the projector



The Airequipt Avventura 380, like most other projectors, took but a push of a button to change to the next slide



Most manual changers, like that of the Kodak Readymatic 500, required a simple pull-push motion to change slides



The least convenient slide changer of all was provided on the Bell & Howell Model 710-EXP; it took a pull-turn-push

itself except the *Kodak Carousel* models and the *Bell & Howell Headliner 710-EXP*. The *Carousels* have a handle on their cardboard carrying case. The *Bell & Howell 710-EXP* has one on the cover that latches over the projector; if it accidentally unlatches while the projector is being carried, the machine may drop. Power cord lengths range from about 6 feet to about 10 feet; remote-control cord lengths, from about 8 feet to about 12 feet, and, for some, extensions are available.

Cleaning the lenses of the *Anscomatics*, *Sears Tower*, and *Kodak Readymatic* was judged easier than it was for most models; the lenses of the *Bell & Howell 937* (and the similar *935*) were judged harder to clean than most.

Replacing the lamp is very easy on most, but not all, models. A spare lamp should be kept on hand, but none of the projectors provide storage space for one. Nor do most models provide a storage place for manufacturer's instructions. The *Argus* and *Bell & Howell Slide-master* models, however, mount detailed instructions in the projector.

None of the projectors was judged to present a burn hazard, but the *Anscomatic* models and the *Sears Tower Cat. No. 9888K* became uncomfortably hot in sections you'd be likely to touch when sliding back the top panel of the projector, as you would do if you were handling a slide already in place or inserting 2¾-inch slides. No projector damaged slides in a severe test that put them through six cycles of four minutes on and four off using 125 volts. But the location of the cooling-air intakes at the bottom of some projectors was judged undesirable,

TRAYS AND STACK LOADERS—WHAT TO CONSIDER

The choice of a slide projector may be partly influenced by whether you prefer a stack loader or a slide tray, and by your needs or preference in tray features. Thus a prospective purchaser should study both the Ratings and this Table of Slide-Holding Devices in making his choice.

Rectangular or circular trays are a convenient means of storing and showing groups of slides. The circular trays, a fairly recent innovation, hold from 80 to 100 slides, depending on the tray—considerably more slides than most rectangular trays do. And they let you show uninterrupted repeat performances, for whatever that may be worth. Some projectors take the circular trays directly, but the *Sears* and *Airequipt Circular Magazines* require the use of small adaptor sprockets that can easily be lost.

Rectangular trays, though they hold only from 30 to 80 slides, store them more compactly. Circular trays will occupy, slide for slide, more than twice as much storage space. To make up for their smaller capacity, some rectangular trays holding only 40 or fewer slides can be hooked together to put on an extended showing, but this arrangement entails a certain amount of extra handling.

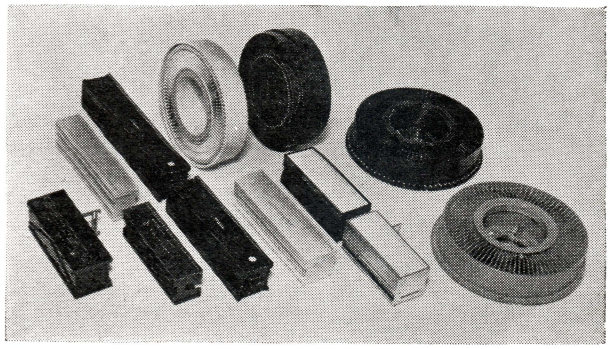
Perhaps the biggest advantage of trays, especially spillproof ones, is the protection they can give your slides against the effects of too much handling. But this advantage comes only if you increase your supply of trays to match your growing number of slides. As the Table shows, expenses can mount up at the rate of $1.50 to $6 or more per 100 slides, although you may be able to cut costs a bit by purchasing several trays at a time. Some trays (Numbers 2, 8, and 15 in the Table) increase the protection given to cardboard slides by providing special aluminum or plastic mounts, but they also increase the difficulty of tray loading enough so that you almost *have* to use the trays for storage.

People with small slide collections or small budgets may perhaps be better off buying a stack-loading projector. It readily accepts a load of slides, shows them in the sequence in which you stacked them, and ejects them in the same sequence into another stack. You must devise your own method of filing and storage, in the original slide boxes or in a case designed for the purpose. Cases are also available, incidentally, for storing some trays, and some trays come with or have available dust covers.

In most instances, a tray-fed projector can, when closed, contain one tray, and a stack-loader projector, the stack loader. However, neither the *Sawyer's Stack Loader* nor the *Airequipt Circular Magazine* nor the *Sawyer's Rototray* can be contained in the closed projector. A *Kodak Carousel Circular Tray* can be stored in a separate compartment of the *Kodak Carousel's* carrying case.

Many of the projectors rated can handle more than one type of tray, and the *Sawyer's* models can be equipped, at extra cost, for stack loading. Also, some trays sold for one line of projectors can be used interchangeably in models of another brand. The Table gives the pertinent data for the various trays and the *Sawyer's Stack Loader*. (Data for the built-in stack loaders in the *Airequipt Autostacks* and the *Kodak Readymatic* are covered in their Ratings.) The Rating of each projector (except the *Readymatic* and the *Airequipt Autostacks*) includes numbers indicating which slide-holding devices in the Table it can use. You may also find independent brands of trays on the market, possibly at very good prices, that will prove to fit some of the projectors. But, unless you buy with return privileges, you should try it out in the store with your projector and slides to be sure it won't jam.

People who already have a good many slides may find their choice of projector especially limited. For one thing, the trays they already have quite often won't be usable



since such an intake can suck up a piece of paper to obstruct the air flow and cause overheating and subsequent damage to a slide, lamp, or lenses.

Most people use a slide projector in their own living room. And the size of this "theater," together with the focal length of their projector's lens, determines how big a picture can be projected. The table below lists approximate projector-to-screen distances needed to fill the common 40-inch screen with transparencies of different sizes and lenses of different focal lengths:

Transparency size	3-in. lens	4-in. lens	5-in. lens	6-in. lens	7-in. lens
Single-frame 35mm	10 ft.	14 ft.	17 ft.	21 ft.	25 ft.
28mm from 126 film	9	12	16	19	22
Standard double-frame 35mm	7	10	12	15	17
Super-Slide from 127 film	7	9	11	14	16

Note that the four-inch lens is probably the most useful in the widest variety of situations—which is why the projectors were tested when possible with lenses of this focal length. Of course, you can settle for a smaller projected picture if the model you want doesn't have a lens of short enough focal length for the size of your living room. But some models offer alternate or extra purchase lenses of different focal lengths (see Ratings).

One other automatic feature is worth mentioning—the timer provided with a number of the projectors. In theory, you set the timer for the length of time you wish to show each slide, then sit back and let the machine be its own operator. In practice, you will seldom want to show every slide for the same length of time, and will, therefore, probably have to keep overriding the timer. So, in CU's opinion, the advantage of a timer over remote control is negligible. No great differences were found among the tested pro-

in a particular projector. For another, slides mounted in plastic or metal frames for extra protection may not fit every tray or may jam some projectors. Only about half the trays and stack loaders tested can take slides any thicker than the usually-provided cardboard mounts.

Even the trays listed in the Table as usable with thick mounts may not hold the very thickest slides. CU strongly advises trying a batch of your slides in the projector before plunking down your money. Run the slides as you would in a regular showing, and also run them backwards and upside down—a sharp-cornered mount may cause a jam-up.

Buyers interested in the comparatively low-priced *Sears* trays may find it useful to know that the *Sears Tower Tray* is identical (except for color and numbering) with the *Anscomatic Tray*, so that slides that work in the latter will also work in the *Sears Tower*. Likewise, the *Sears Circular Magazine* and the *Sears Airequipt Metal Magazines* match their *Airequipt* counterparts.

TABLE OF SLIDE-HOLDING DEVICES

Listed alphabetically. Ratings indicate (by reference to the numbers preceding the models) which can be used with each projector.

	Price per unit	Tray cost per 100 slides	Number of slides held	Can use thick slides	Spill-proof	Trays hook together
AIREQUIPT						
1. CIRCULAR MAGAZINE	$2.95	$2.95	100	No	Yes	No
2. METAL MAGAZINE	2.25	6.25	36	No	Yes	Yes[A]
3. VARI-MOUNT MAGAZINE	1.49	4.14	36	Yes	Fairly	Yes[A]
ANSCOMATIC						
4. STAK-PAK JN291	1.32[B]	3.29	40	Yes	No	Yes
ARGUS						
5. TRAY 581	2.29	2.86	80	No	Fairly	No
6. TRAY 587	1.98	3.30	60	No	Fairly	No
BELL & HOWELL						
7. MICRO-FIT SLIDE TRAY 071079	1.50	5.00	30	Yes	No	No
8. MASTER FORTY TRAY 072254	1.99	4.98	40	No	No	No
KODAK CAROUSEL						
9. SLIDE TRAY 581 (circular)	2.95	3.69	80	Some	Yes	No
10. UNIVERSAL CIRCULAR TRAY 588	3.95	4.94	80	Yes	Yes	No
SAWYER'S						
11. EASY-EDIT TRAY 6201	1.45	4.03	36	Yes	Fairly	No
12. ROTOTRAY 6214 (circular)	2.95	2.95	100	No	Fairly	No
13. STACK LOADER 6271	6.00	[C]	About 55	No	—	—
SEARS						
14. CIRCULAR MAGAZINE 9984	2.75[D]	2.75	100	No	Yes	No
15. AIREQUIPT METAL MAGAZINE 9978	1.74[D]	4.83	36	No	Yes	Yes[A]
16. TOWER TRAY 9975	.59[D]	1.48	40	Yes	No	Yes

[A] *Requires extra-cost Airequipt connector.* [B] *Sold in groups of three, with case, $3.95*

[C] *Not intended for or suitable for storing slides.* [D] *Plus shipping.*

jectors in ease of setting up, raising and lowering the picture, or in using the picture-tilt adjustment (where provided). None of the projectors would be likely to mar a table top. And no shock hazard was found in any of the models tested, even under conditions of high humidity.

A word on the Ratings

The overall quality of the models at the top of the Ratings was high enough to warrant check-rating, but no specific group could be segregated that met the other criterion for check-rating—being "significantly superior to . . . other . . . models tested." Adjacent models all down the Ratings were very close in quality, although the range from top to bottom was substantial. Overall quality had little correlation with price, though—the $119.95 *Bell & Howell Slide-Master 937*, for example, was estimated to be very little better than the $54.50 *Sawyer's 500 S*.

A number of Best Buys are listed. They include both high- and intermediate-ranking models and represent a spread in list price from about $95 to $55. It should be noted, however, that CU based these Best Buy designations on *list* prices. Substantial discounts sometimes available may alter the Best Buy picture considerably.

RATINGS OF 500-WATT PROJECTORS FOR 2-IN. SLIDES

Listed in order of estimated overall quality based on judgments of convenience of operation and maintenance, on slide thicknesses accommodated, and on picture brightness, but not on sharpness or brightness uniformity, because of sample variability (see story). Closely ranked models differ little in estimated overall quality. Ratings should be used in conjunction with the Table of Slide-Holding Devices on page 565. Prices are list; substantial discounts are generally available.

Dimensions are in order of height, width, depth. Except as noted, each projector handles only 2-in. slides; has a carrying handle and adjustments for picture tilt and elevation; can be conveniently returned to a previous slide; and provides for convenient reorienting of a slide, convenient projecting to arrange a new batch of slides in desired order, and convenient replacement of lamp. Brightness, accessibility for freeing a jammed slide and cleaning lenses, fan noise, and slide-changer noise are noted only if they differ significantly from the average.

ACCEPTABLE

KODAK CAROUSEL 800 No. B804 (Eastman Kodak Co., Rochester, N.Y.), $144.50 with Kodak Projection Ektanon 4-in. f/3.5 lens, 12-ft. remote control, one slide tray (No. 9 in Table), and cardboard carrying case. Simulated leather *Kodak Carousel Case No. B584C*, $12.95; 25-ft. extension *No. 586* for remote control, $4.25. Can also use slide tray No. 10 in Table. 7¼x13¾x12 in. with cardboard carrying case; relatively bulky. 13 lb. Carrying handle on carrying case, not projector. Pushbutton slide changing. Freeing a jammed slide, relatively convenient. Remote control can change slides, focus, and return to a previous slide. Calibrated slide timer can be set for 5, 8, or 15 sec. With timer on, remote control can reject a slide but cannot hold it; rejecting a slide or returning to a previous slide changes the on-time of the next slide. Lamp replacement, convenient, but user must turn projector all the way over to keep lenses from falling out. Slide changing, relatively quiet. Has dimmer and illuminated control panel. Also available (not tested) as *Nos. B803* ($144.50) with 3-in. lens, *B805* ($144.50) with 5-in. f/3.5 lens, *B806* ($168.50) with 5-in. f/2.8 lens, and *B807* ($168.50) with 7-in. lens.

KODAK CAROUSEL 700 No. B704 (Eastman Kodak Co.), $119.50. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Kodak Carousel 800 No. B804*, preceding; but has no timer and remote control cannot focus. All other comments apply. Also available (not tested) as *Nos. B703* ($119.50) with 3-in. lens, *B705* ($119.50) with 5-in. f/3.5 lens, *B706* ($143.50) with 5-in. f/2.8 lens, and *B707* ($143.50) with 7-in. lens.

SEARS TOWER Cat. No. 9888K (Sears, Roebuck), $94.61 plus shipping with Sears Coated Anastigmat 5-in. f/3.5 lens, 10-ft. remote control, and one slide tray (No. 16 in Table). Carrying case *Cat. No. 9864*, $16.49 plus shipping. Can also use slide trays Nos. 4 and 7 in Table. 8⅞x10¼x13½ in.; relatively bulky. 20 lb.; relatively heavy. Pushbutton slide changing. Reorienting a slide, somewhat inconvenient. Freeing a jammed slide, relatively convenient. Remote control can change slides, focus, return to a previous slide, and project a pointer on the screen. Has uncalibrated slide timer. With timer on, remote control can reject a slide but cannot hold it. Cleaning of lenses, relatively convenient. Slide changing, relatively noisy. Has dimmer, illuminated control panel, and outlet for room lamp that is switched off and on automatically. Section of housing that is likely to be touched became uncomfortably hot. Will project 2¾-inch slides and one frame of stereo slides, but neither can be put in tray. ***A BEST BUY.***

ANSCOMATIC II Model JN-295 (General Aniline and Film Corp., NYC), $139.50 with Ansco 5-in. f/3.5 lens, 10-ft. remote control, and one slide tray (No. 4 in Table). Accessory 50-ft. remote control *JN-306* available, $12.50. Can also use slide trays Nos. 7 and 16 in Table. 9x10⅛x13½ in.; relatively bulky. 21 lb.; relatively heavy. Pushbutton slide changing. Reorienting a slide, somewhat inconvenient. Freeing a jammed slide, relatively convenient. Remote control can change slides, focus, return to a previous slide, and project a pointer on the screen. Has uncalibrated slide timer. With timer on, remote control can reject a slide but cannot hold it. Cleaning of lenses, relatively convenient. Slide changing, relatively noisy. Has dimmer, illuminated control panel, and outlet for room lamp that is switched off and on automatically. Section of housing that is likely to be touched became uncomfortably hot. Can project 2¾-in. slides and one frame of stereo slides, but neither can be put in tray. Also available (not tested): 7-in. lens ($24.95 extra).

SAWYER'S ROTOMATIC 700 (Sawyer's, Inc., Portland, Ore.), $122.50 with Coated Anastigmat 4-in. f/3.5 lens, 9¾-ft. remote control, and two slide trays (Nos. 11 and 12 in Table). 10-ft. extension for remote control, $4. Can also use *Stack Loader* (No. 13 in Table) and slide trays Nos. 4, 7, and 16 in Table. 5⅜x11⅛x11 in.; relatively compact. 13 lb. Pushbutton slide changing. Return to previous slide, convenient with slide trays, but relatively inconvenient with *Stack Loader*. Reorienting a slide, somewhat inconvenient with *Stack Loader* and with *Rototray* (No. 12 in Table) but convenient with *Easy-Edit Tray* (No. 11 in Table). Projecting to arrange a new

batch of slides in desired order, convenient with *Easy-Edit Tray*, somewhat inconvenient with *Stack Loader*, not possible with *Rototray*. Freeing a jammed slide, relatively convenient. Remote control can change slides, focus, and return to a previous slide. Has uncalibrated slide timer. With timer on, remote control can reject a slide but cannot hold it; rejecting a slide changes the on-time of the next slide. With *Stack Loader* only, slide changing relatively noisy. More stray light from projector than from most models tested. No picture-tilt adjustment. Also available (not tested): 3-in. lens ($15 extra), 5-in. lens ($20 extra), or 6-in. lens ($45 extra).

SAWYER'S ROTOMATIC 600 (Sawyer's, Inc.), $112.50. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Sawyer's Rotomatic 700*, preceding, but has no timer. All other comments apply. Also available: 3-in. lens ($15 extra), 5-in. lens ($20 extra), or 6-in. lens ($45 extra).

SAWYER'S 500 R (Sawyer's, Inc.), $99.95 with Coated Anastigmat 4-in. f/3.5 lens, 9¾-ft. remote control, and one slide tray (No. 11 in Table). 15-ft. extension for remote control, $5. Can also use *Stack Loader* (No. 13 in Table) and slide trays Nos. 4, 7, 12, and 16 in Table. 5¾x10¾x11⅝ in.; relatively compact. 13 lb. Pushbutton slide changing. Return to previous slide, convenient with slide trays but relatively inconvenient with *Stack Loader*. Reorienting a slide, convenient with *Easy-Edit Tray* (No. 11 in Table) but somewhat inconvenient with *Stack Loader* and with *Rototray* (No. 12 in Table). Projecting to arrange a new batch of slides in desired order, convenient with *Easy-Edit Tray*, somewhat inconvenient with *Stack Loader*, not possible with *Rototray*. Remote control can change slides, focus, and return to a previous slide. With *Stack Loader* only, slide changing relatively noisy. Bottom location of air intake judged relatively undesirable. Fan cannot be left on when projection lamp is turned off. Also available (not tested): 3-in. lens ($15 extra), 5-in. lens ($20 extra), or 6-in. lens ($45 extra). According to the manufacturer, this model has been discontinued but may still be available in some stores.

KODAK CAROUSEL 600 No. B604 (Eastman Kodak Co.), $79.50. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Kodak Carousel 800 No. B804*, above, but has no timer and no remote control, and return to previous slide judged relatively inconvenient. All other comments apply. ***A BEST BUY.*** Also available (not tested) as Nos. *B603* ($79.50) with 3-in. lens, *B605* ($79.50) with 5-in. f/3.5 lens, *B606* ($103.50) with 5-in. f/2.8 lens, and *B607* ($103.50) with 7-in. lens.

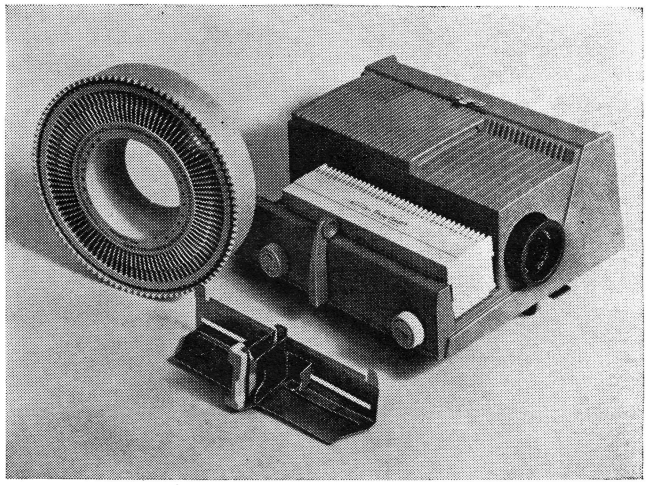
AIREQUIPT AVVENTURA 380 (Airequipt, Inc., New Rochelle, N.Y.), $124.95 with Airequipt Luminon 4-in. f/2.8 lens, 10-ft. remote control, and one slide magazine (No. 2 in Table). 12-ft. extension for remote control, $2.95. Can also use slide trays Nos. 1, 3, 14, and 15 in Table. 6⅛x11¾x10⅝ in.; relatively compact. 11 lb.; relatively light. Picture was a little brighter than that of most models tested. Pushbutton slide changing. Reorienting a slide, somewhat inconvenient with *Metal Magazines* (Nos. 2 and 15 in Table), but convenient with other slide trays. Freeing a jammed slide, very inconvenient. Remote control can change slides, focus, and return to a previous slide. Has uncalibrated slide timer. With timer, remote control can reject a slide but cannot hold it. Lamp replacement, somewhat inconvenient. Fan, relatively quiet. Also available (not tested): 5-in. lens ($19.95 extra).

ANSCOMATIC R Model JN-338 (General Aniline and Film Corp.), $109.95 with Ansco 4-in. f/3.5 lens, 9¾-ft. remote control, and one slide tray (No. 4 in Table). Can also use slide trays Nos. 7 and 16 in Table. 8¾x10¼x13½ in.; relatively bulky. 19 lb.; relatively heavy. Pushbutton slide changing. Reorienting a slide, somewhat inconvenient. Freeing a jammed slide, relatively convenient. Remote control can change slides but cannot focus or return to a previous slide. Has uncalibrated slide timer. With timer on, remote control can reject a slide but cannot hold it. Cleaning of lenses, relatively convenient. Slide changing, relatively noisy. Has outlet for room lamp that is switched off and on automatically. Section of housing likely to be touched became uncomfortably hot. Can project 2¾-in. slides and one frame of stereo slides, but neither can be put in tray. Also available (not tested): 7-in. lens ($24.95 extra).

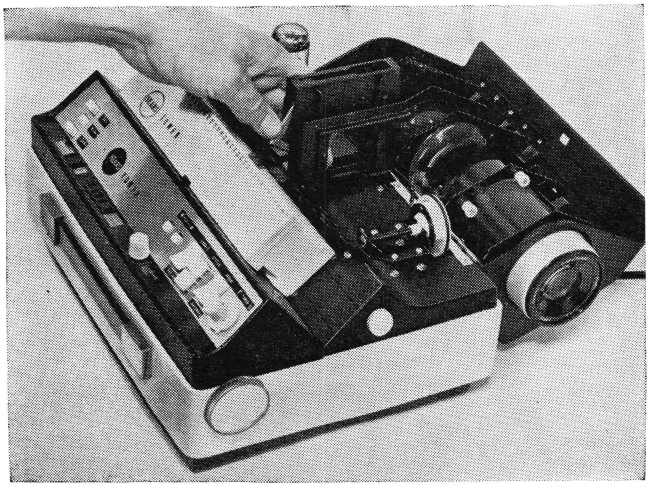
SAWYER'S 500 ER (Sawyer's, Inc.), $84.95. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Sawyer's 500 R*, above, but remote control **cannot focus** or return to a previous slide. All other comments apply. ***A BEST BUY.*** Also available: 3-in. lens ($15 extra), 5-in. lens ($20 extra), or 6-in. lens ($45 extra). According to the manufacturer, this model has been discontinued but may still be available in some stores.

AIREQUIPT AVVENTURA 360 (Airequipt, Inc.), $104.95. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Airequipt Avventura 380*, above, but has no timer, return to previous slide somewhat inconvenient, and remote control cannot return to a previous slide. All other comments apply. Also available: 5-in. lens ($19.95 extra).

ARGUS ELECTROMATIC 573 (Argus, Inc., Chicago), $160 with Argus 4-in. f/3.5 lens, 10-ft. remote control, and one slide tray (No. 6 in Table). 30-ft. extension for remote control, $7.50. Can also use slide tray No. 5 in Table. 6½x14½x11⅜ in. 20 lb.; relatively heavy. Picture was a little brighter than that of most models



The $54.50 Sawyer's 500 S, one of a number of Best Buys, comes equipped with the rectangular slide tray shown on the projector, but it can also use a circular tray or stack loader



The swing-open design of the Sears Tower contributes much to ease of maintenance. The photo shows how easy it is to free a jammed slide; lamp and lenses are also readily accessible

SLIDE PROJECTOR RATINGS
continued

tested. Pushbutton slide changing. Remote control can change slides, focus, return to a previous slide, and project a pointer on the screen. Calibrated slide timer can be set for 4, 8, 16, or 32 sec. With timer on, remote control can reject a slide but cannot hold it, and rejecting a slide or returning to a previous slide changes the on-time of the next slide. Lamp replacement, somewhat inconvenient. Fan, relatively noisy. Has illuminated control panel. Bottom location of air intake judged relatively undesirable. Also available as *Argus Electromatic 570* ($130) in finished metal instead of wood-veneer finish. Both models were tested.

AIREQUIPT AUTOSTACK 550 (Airequipt, Inc.), $99.95 with Airequipt 4-in. f/3.5 Luminac lens, 11¾-ft. remote control, slide file for about 650 cardboard slides, slide handler for loading and unloading a stack of slides (judged a worthwhile convenience), and a built-in stack loader that will hold approx. 80 cardboard slides and can also handle thick slides. Cannot use a tray. 7¼x10x12¼ in. 10 lb.; relatively light. Picture was a little brighter than that of most models tested. Pushbutton slide changing. Return to previous slide, much less convenient than most. Reorienting a slide, somewhat inconvenient. Projecting to arrange a new batch of slides in desired order, somewhat inconvenient. Remote control can change slides and focus but cannot return to a previous slide. Lamp replacement, somewhat inconvenient. Slide changing, relatively noisy. Fan, relatively noisy and cannot be switched off. More stray light from projector than from most models tested. Also available (not tested): 5-in. lens ($19.95 extra).

SAWYER'S 500 A (Sawyer's, Inc.), $69.95. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Sawyer's 500 R*, above, but has pull-push slide changing and no remote control. All other comments apply. Also available: 3-in. lens ($15 extra), 5-in. lens ($20 extra), or 6-in. lens ($45 extra). According to the manufacturer this model has been discontinued but may still be available in some stores.

ARGUS 541 (Argus, Inc.), $75 with Argus 4-in. f/3.5 lens, 12¼-ft. remote control, and one slide tray (No. 6 in Table). Can also use slide tray No. 5 in Table. 6⅛x13x11¼ in. 14 lb. Picture was a little brighter than that of most models tested. Pushbutton slide changing. Remote control can change slides but cannot focus or return to a previous slide. Lamp replacement, somewhat inconvenient. Fan, relatively noisy. No picture-tilt adjustment. Has small screen built into cover. Bottom location of air intake judged relatively undesirable.

AIREQUIPT AVVENTURA 340 (Airequipt, Inc.), $67.50. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Airequipt Avventura 380*, above, but has pull-push slide changing, no timer, no remote control, and return to previous slide judged relatively inconvenient. All other comments apply. Also available: 5-in. lens ($19.95 extra).

BELL & HOWELL SLIDE-MASTER 937 (Bell & Howell Co., Chicago), $119.95 with Bell & Howell Coated Anastigmat Trionar 4-in. f/3.5 lens, 7¾-ft. remote control, and one slide tray (No. 8 in Table). 15-ft. extension for remote control, $6.95. 6⅝x12¼x13½ in. 19 lb.; relatively heavy. Picture was a little less bright than that of most models tested. Pushbutton slide changing. Projecting to arrange a new batch of slides in desired order, somewhat inconvenient but, for arranging, slides can be previewed on built-in viewer. Remote control can change slides, focus, and return to a previous slide. Cleaning of lenses, relatively inconvenient. No picture-tilt adjustment. Fan cannot be left on when projection lamp is turned off. Also available (not tested): 7½-in. lens ($42.50 extra).

SAWYER'S 500 S (Sawyer's, Inc.), $54.50. Basically the same as *Sawyer's 500 R*, above, except that it has pull-push slide changing, no remote control, and return to previous slide judged relatively inconvenient when using slide trays. All other comments apply. ***A BEST BUY*** for those willing to put up with fewer conveniences than are offered by the other, higher-priced Best Buys. Also available: 3-in. lens ($15 extra), 5-in. lens ($20 extra), or 6-in. lens ($45 extra). According to the manufacturer, this model has been discontinued but may still be available in some retail stores.

BELL & HOWELL HEADLINER PROJECT-OR-VIEW 500 Model 710-EXP (Bell & Howell Co.), $69.95 with Bell & Howell Trionar Coated Anastigmat 4-in. f/3.5 lens and one slide tray (No. 7 in Table). Can also use slide trays Nos. 4 and 16. 8x11½x11¼ in. 11 lb.; relatively light. Picture was a little brighter than that of most models tested. Pull-turn-push slide changing. Return to previous slide, and reorienting a slide, relatively inconvenient. Projecting to arrange a new batch of slides in desired order not possible, but, for arranging, slides can be previewed on built-in viewer. No remote control. Fan, relatively noisy and cannot be switched off. No picture-tilt adjustment. Has small screen built into cover. Also available (not tested), as *Model 710-3EXP* ($69.95), with 3-in. lens.

KODAK READYMATIC 500 Model 1 No. 503 (Eastman Kodak Co.), $67.50 with *Kodak Projection Ektanon* 4-in. f/3.5 lens and built-in stack loader, which will hold approx. 36 cardboard slides and cannot use thick slides. Cannot use a tray. 6¼x13½x11½ in. 13 lb. Pull-push slide changing. Return to previous slide, relatively inconvenient. No remote control. Cleaning of lenses relatively convenient. Slide changer, relatively noisy. Fan cannot be switched off. No picture-tilt adjustment. Also available (not tested) as *No. 513* ($67.50), with 3-in. lens. Separate lenses: 5-in. f/3.5 lens ($12.50 extra), 5-in. f/2.8 lens ($36.50 extra), and 7-in. lens ($36.50 extra).

BELL & HOWELL SLIDE-MASTER 935 (Bell & Howell Co.), $98.88. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Bell & Howell Slide-Master 937*, above, but return to previous slide relatively inconvenient and remote control cannot focus or return to a previous slide. All other comments apply. Also available: 7½-in. lens ($42.50 extra).

AIREQUIPT AUTOSTACK 500 (Airequipt, Inc.), $69.95. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Airequipt Autostack 550*, above, but has pull-push slide changing and no remote control. All other comments apply. Also available: 5-in. lens ($19.95 extra).

ARGUS 538 (Argus, Inc.), $55. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Argus 541*, above, but has pull-push slide changing, no remote control, and when projector is closed for carrying, lens is still exposed. All other comments apply.

AIREQUIPT SPRITE 28 (Airequipt, Inc.), $59.95 with Airequipt Luminal 4-in. lens and one slide magazine (No. 2 in Table). Can also use slide trays Nos. 1, 3, 14, and 15 in Table. 6x10⅛x10⅝ in.; relatively compact. 7 lb.; relatively light. Picture was a little less bright than that of most models tested. Pull-push slide changing. Return to previous slide, relatively inconvenient. Reorienting a slide, somewhat inconvenient. Freeing a jammed slide, relatively inconvenient. No remote control. Lamp replacement, somewhat inconvenient. More stray light from projector than from most models tested. No picture-tilt adjustment. When projector is closed for carrying, lens is still exposed. According to manufacturer, this model has been discontinued but may still be available in stores.

SEARS 26 Cat. No. 9826 (Sears, Roebuck), $37.52 plus shipping with Sears 4-in. lens, and one slide magazine (No. 14 in Table). Can also use slide trays Nos. 1, 2, 3, and 15 in Table. 6¼x10⅛x10⅝ in. without magazine; relatively compact. 7 lb.; relatively light. Picture was a little less bright than that of most models tested. Pull-push slide changing. Return to previous slide, relatively inconvenient. Reorienting a slide, somewhat inconvenient. Projecting to arrange a new batch of slides in desired order not possible. Freeing a jammed slide very inconvenient. No remote control. Lamp replacement, somewhat inconvenient. More stray light from projector than from most models tested. No picture-tilt adjustment. When projector is closed for carrying, lens is still exposed.

AIREQUIPT SPRITE 25 (Airequipt, Inc.), $49.95. Not tested but, on the basis of manufacturer's literature, appears to be basically the same as *Airequipt Sprite 28*, above, but projecting to arrange a new batch of slides in desired order not possible, freeing a jammed slide is very inconvenient, and fan cannot be switched off. All other comments apply.

Financial Report and Election of Directors

In accordance with the provisions of the bylaws, CU's Annual Meeting for 1965 (CONSUMER REPORTS, September 1965) was held on September 25 at the CU headquarters in Mount Vernon, N.Y. CU's financial report, as presented at the meeting, appears on this page, along with the results, announced at the meeting, of elections to CU's Board of Directors in the recent balloting among CU members.

To the Board of Directors of
Consumers Union of United States, Inc.:

We have examined the balance sheet of CONSUMERS UNION OF UNITED STATES, INC., as of May 31, 1965, and the statement of income and general reserve for the year then ended. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and statement of income and general reserve present fairly the financial position of Consumers Union of United States, Inc., at May 31, 1965, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Lybrand, Ross Bros. & Montgomery
Certified Public Accountants

New York, N.Y., July 23, 1965

BALANCE SHEET, May 31, 1965

ASSETS

Current assets:		
Cash (including $1,253,663 on deposit in savings banks)		$1,728,610
U.S. Government obligation at cost, plus accrued interest (approximates market)		99,836
Accounts receivable, net		167,613
Inventory of paper and supplies, at cost		281,550
Test automobiles		32,520
Tests in process		158,097
Prepaid expenses		137,447
Total current assets		2,605,673
Cash segregated for severance payments		193,671
Property, plant, and equipment, at cost:		
Land	$ 62,088	
Buildings	1,001,118	
Furniture, fixtures, and equipment	901,602	
	1,964,808	
Less allowance for depreciation	1,130,819	833,989
		$3,633,333

LIABILITIES AND GENERAL RESERVE

Current liabilities:	
Accounts payable and accrued expenses	$ 196,168
Unearned subscription, newsstand, and other revenues, current portion	1,401,666
Total current liabilities	1,597,834
Unearned subscription revenues, noncurrent portion	1,542,132
Accrued severance expense	379,844
General reserve, as annexed	113,523
	$3,633,333

STATEMENT OF INCOME AND GENERAL RESERVE
for the year ended May, 31, 1965

Income:			
Revenue from subscriptions, newsstand, and other sales			$4,255,280
Interest			65,920
Miscellaneous, net			17,301
			4,338,501
Costs and expenses:			
Preparation and publication of material:			
Costs of reports, buying guides, and books	$837,149		
Technical and editorial expense	951,723		
Market data, test sample purchasing, and library expense	182,073	$1,970,945	
Income procurement		873,862	
Servicing of subscriptions		498,152	
Duplicating and offset, wrapping, inserting, and mailing expense		322,625	
Executive, accounting, etc.		253,833	
Maintenance		130,738	
Depreciation		67,677	
Education and organization		97,060	
Personnel department, lunchroom, etc.		45,060	
Ballots and questionnaires		26,703	
Grants and contributions		31,891	
Miscellaneous, net		32,945	4,351,491
Net loss for the year			12,990
General reserve, beginning of year			126,513
General reserve, end of year			$ 113,523

CU'S 1965 BOARD ELECTION

Results of balloting to fill seven vacancies on CU's Board of Directors were announced at CU's Annual Meeting. A total of 139,229 ballots were received from CU's membership, of which 678 were declared invalid because more than seven nominees were voted for, contrary to instructions on the ballot. The 138,551 valid ballots set a new record—9,214 more than were cast last year. The nominees, together with the number of votes each received, are as follows (the candidates noted were elected to three-year terms on CU's Board):

Helen Nelson (elected)	114,655
William Haller, Jr. (elected)	107,440
Persia Campbell (elected)	107,009
Arch W. Troelstrup (elected)	97,624
Patrick L. Sullivan (elected)	80,638
William D. Drake (elected)	64,486
Henry H. Villard (elected)	60,768
Samuel L. Myers	49,247
Karl D. Gregory	45,029
Barton R. Burkhalter	44,435
William Muehl	41,839
Daryl Jay Bem	39,533
Kenneth B. Clark	37,654
Henry L. Munn	withdrew; see page 523

MOZART: Symphonies Nos. 40 in G minor (K. 550) and 41 in C major ("Jupiter," K. 551). Philharmonic Orchestra conducted by Otto Klemperer. Angel 36183 (mono), $4.79; S 36183 (stereo), $5.79.

Mozart's two most popular (and oft-recorded) symphonies are conducted here by an 80-year-old legend. Otto Klemperer is the last of the great band of German conductors who came to fame shortly after the turn of the century. His performances here, though, are a little disappointing. Dignity is present, and so is an obvious dedication to the music. But Mozart was a more volatile composer than these rather heavy readings would indicate. There is not enough tempo variation among the movements of the G minor Symphony; and, while Klemperer's deliberate pacings are better in the *Jupiter*, the over-all effect here, too, is stolid. Excellent recorded sound is present on both mono and stereo discs.

BARTOK: String Quartets (6, complete). Juilliard String Quartet. Columbia D3L 317 (mono), 3 discs, $9.59; D3S 717 (stereo), 3 discs, $11.59.

The Juilliard String Quartet has, in a way, a monopoly on these important works. About 15 years ago it was the Juilliard group that was responsible for the first integral recording of them. The music is a permanent part of the players' repertoire, and through the years they have achieved a kind of rapport with it that no other ensemble can duplicate. This foursome is composed of young players, and the modernity of the music strikes a responsive chord in them. These six quartets spread over Bartok's entire creative span and are accepted as monuments of 20th-century music. Like many of Bartok's other compositions they may sound forbidding and cacophonous at first. Much of the writing is atonal and highly dissonant, especially in the last four quartets. But patience will be rewarded for those listeners who give the music a chance. A good deal of it is based on a sort of transmutation of old Hungarian melodies and snappy folk rhythms. To the strong and incisive performances of the Juilliard Quartet is added fine recording. The stereo version is preferred, and the opening of the first quartet illustrates why. Each instrument enters, one by one, in a slightly different placement, giving the illusion of a quartet in one's living room.

BEETHOVEN: Violin Sonata in A major ("Kreutzer," Op. 47); DEBUSSY: Violin Sonata; BARTOK: Violin Sonata No. 2; Rhapsody No. 1. Joseph Szigeti, Violin, and Béla Bartok, piano. Vanguard VRS 1130/1 (mono only), 2 discs, $9.58.

Béla Bartok, a refugee from Nazism, arrived in America on April 11, 1940. Two days later he played the piano in a recital at the Library of Congress with his Hungarian friend and colleague, the violinist Joseph Szigeti. The latter, of course, was then at his height, one of the great instrumentalists of the century. Bartok was recognized the world over as a major composer, and his great reputation as a creative figure had a tendency to make many forget what an altogether admirable pianist he was. It is fortunate for posterity that the Library of Congress recorded the entire recital, and it is our good fortune that Vanguard has received permission to bring it out. For, while there is no lack of Szigeti recordings, Bartok as a pianist is represented on miserably few discs, all of them collectors' items very difficult to find. His playing in this album is magnificent. As an instrumentalist he stemmed from the romantic school, which means broad tempos, plenty of color, rhythmic flexibility, and subtle details of nuance. He and Szigeti had appeared together many times. Both musicians represented much the same tradition, and it is little wonder that their collaboration is near perfect. Szigeti's playing is typical—a little rough with some rasps and awkward-sounding bowings, but always immensely musical, powerful, and stylistically impeccable. Special interest attaches to the performance of the Bartok Second Sonata (its only available recording), for there is the final touch of authenticity when a composer who is a skilled performer is heard in his own music. Considering its age, the recorded sound is not bad at all. A fine album, historically important and musically fascinating.

POULENC: Septet for Piano and Winds; Trio for Oboe, Bassoon and Piano; Sonata for Flute and Piano. Jacques Février, piano; Michel Debost, flute; and Paris Wind Quintet. Angel 36261 (mono), $4.79; S 36261 (stereo), $5.79.

These are peppy performances of peppy music. It may be that in his chamber music Poulenc wrote the same piece again and again, but it was a pretty good one to begin with. These three pieces have much in common: sophistication, wit, light-heartedness, sentimentality. The second subject in the first movement of the Septet is one of the juiciest, prettiest, sexiest themes in the music of this century. Of course it's all light and fluffy; but it is also neosalon music of craftsmanship and originality. The performances can be summed up briefly: beautiful playing from expert French instrumentalists. The recorded sound is good, though not outstanding—a little lacking in mellowness. The stereo has more depth and presence than the mono.

LISZT: Sonata in B minor; SCHUBERT: Sonata in A minor (Op. 143). Emil Gilels, piano. Victor LM 2811 (mono), $4.79; LSC 2811 (stereo), $5.79.

Not since the Horowitz recording of the 1930s has there been a performance of the Liszt B minor Sonata to match this one.

The records discussed here were selected by CU's music consultant to meet a range of classical taste, with musical interest always paramount and the emphasis on stereophonic releases. Judgments are made after listening to pressings of each record on carefully selected and maintained stereo equipment. While the technical quality of the records purchased for review generally has proved to be good, some have distortion and/or other bugs. Where such deficiencies have been heard by the reviewer, they are noted in the accompanying reviews. Readers should be aware, however, that the tone controls of good record-playing systems can offer the opportunity to make even a bad recording tolerable to hear. The flat tone-control positions are not sacrosanct, and the intelligent listener should experiment with these controls to bring out the best in a record. The better the equipment, the more versatile the controls. Prices given are publishers' list, but substantial discounts are widely available.

Gilels plays like a young Rubinstein, with tremendous virtuosity coupled to taste and musicianship. Metrically, the Russian pianist is very direct. There are few rubato effects and no juggling in the name of "expression." Rather there is a big sweep from beginning to end. The Schubert A minor Sonata, receives an honest and accurate performance, but this kind of music is less in Gilels' blood. The liner notes to the album are ridiculous: a perfumed essay about Gilels, just a passing sentence or two about the music. The discs have good recorded sound, rather hard in quality, with very little difference between mono and stereo. With most equipment the slight edge that the stereo has would be imperceptible, and so the mono version is recommended.

SIBELIUS: Violin Concerto; BRUCH: Violin Concerto in G minor. Zino Francescatti and the New York Philharmonic, conducted by Leonard Bernstein (for the Sibelius) and by Thomas Schippers (for the Bruch). Columbia ML 6131 (mono), $4.79; MS 6731 (stereo), $5.79.

Both of these popular violin concertos have been recorded umpteen times before. The only reason for mentioning this entry is that it is played so well. Francescatti is the romantic violinist *par excellence*, with a resplendent technique, a tone that is sheer damask, and a throbbing vibrato that extracts every bit of sentiment from the music. His performances here are well up in the Heifitz-Oistrakh class. And Columbia has supplied extremely rich recorded sound that is easily as good as these two concertos have ever received and much better than most. The solo instrument is well forward (though not annoyingly so), and it is well maintained in one position in the stereo version, which has more body than the otherwise well-recorded mono.

BOYCE: Eight Symphonies. I Solisti di Zagreb, conducted by Antonio Janigro. Bach Guild BG 668 (mono), $4.79; BGS 70668 (stereo), $5.79.

William Boyce (1710-1779) was an English composer whose only claims to fame are these symphonies. It is not that he composed no other music (some of it has even been recorded), but that nothing of his has captured the imagination as have these eight fine works. They are called "symphonies," though many listeners will find them much closer in style and treatment to the Handel concerti grossi. The music is lovely, bracing, and beautifully written—baroque at nearly its best. Some movements of the symphonies are very British in feeling, suggesting hornpipes, country dances, and even street calls. Thus there is an element of personality that is lacking in much baroque music. As in most of the Solisti di Zagreb performances, the playing is direct, musical, scholarly, and supple. This is one of the very best groups of its kind. There can be nothing but praise for the realistic quality of the recorded sound. The strings are velvety; the surfaces are quiet; and there is plenty of resonance and spaciousness. All of these qualities are exemplified in the stereo version (the only stereo version of the Boyce symphonies, by the way). Good as the mono is, it lacks the depth and color of the stereo.

BERLIOZ: Romeo and Juliet (complete). Gladys Swarthout, mezzo-soprano; John Garris, tenor; Nicola Moscona, bass; chorus prepared by Peter Wilhousky; NBC Symphony, conducted by Arturo Toscanini. Victor LM 7034 (mono only), 2 discs, $9.59.

This has been quite a period for the release of new items of historical importance (on these pages, note the Szigeti-Bartok recital and the Toscanini-Serkin disc, as well as this Toscanini album). Victor processed this performance from the Toscanini-NBC broadcasts of February 9 and 16, 1947. Presumably the locale was Studio 8-H, with its notoriously dry acoustics; and this recording suffers thereby. But it would be as silly to rate these two discs solely on recorded sound as to rate the Parthenon solely on the number of pillars remaining in place. The point is that this is an incandescent performance of a remarkable score, and its virtues shine right through the dated sonic qualities. The orchestra plays with the typical thrust and clarity of the best Toscanini performances, and the melodic elements are outlined with the incisiveness that seemed to be Toscanini's trait alone (one can easily hear the conductor humming along in quite a few places). The singing is good. Nothing remarkable is contributed by the three soloists, but they are steady and dependable. The *Romeo and Juliet* of Berlioz remains one of the imaginative *tours de force* of the entire 19th century (just as the *Queen Mab* scherzo, so stunningly conducted here by Toscanini, remains one of the orchestral *tours de force*). Don't let the fact that the recording is not "hi-fi" blind you to the immense importance of this album.

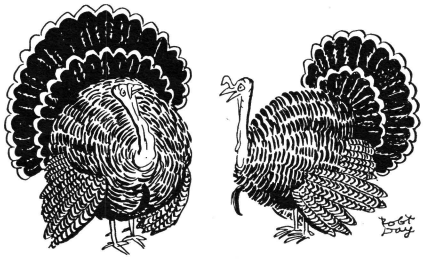
BEETHOVEN: Piano Concerto No. 4 in G. Rudolf Serkin and NBC Symphony, conducted by Arturo Toscanini. Victor LM 2797 (mono only), $4.79.

This recording, like the one preceding of *Romeo and Juliet*, was never before commercially available; it has been processed from the broadcast performance of November 26, 1944. The G major Concerto of Beethoven's is not a piece normally associated with Toscanini and apparently he led it on only one other occasion during all his years in the United States. Serkin, however, has played it more often, and it is interesting to see how his conception has changed. His later recordings of the work are reflective and judiciously paced. But in this 1944 performance, he is all youthful ardor, playing with tremendous verve, nervosity, and excitement. Liaison between piano and podium is what one would expect between two such musicians. Never is there a lagging moment, and the concerto provides an electrical impact. It conceivably could be argued that the lyric, tender G major Beethoven is not the vehicle for so tense and fiery a performance. Toscanini, especially, conducts with fierce drive and concentration, pushing the music rather than caressing it. Most people, however, will be swept away by this interpretation. The disc provides fair sound, considering the circumstances of the recording.

BARBER: Violin Concerto; HINDEMITH: Violin Concerto. Isaac Stern and the New York Philharmonic, conducted by Leonard Bernstein. Columbia ML 6113 (mono), $4.79; MS 6713 (stereo), $5.79.

Stern, who plays everything and plays it well, is the most protean of living violinists. Here he turns his attention to a pair of modern concertos. The Barber is lyric, melodic, attractive, and very much in the 19th-century tradition. Hindemith's concerto, somewhat more acerbic, displays the composer's dexterous craftsmanship, the neo-baroque style he represented so convincingly, and a big, strong sweep. Stern handles both works in an entirely controlled, musicianly manner. His is a modern instrumental violin style, in which a rather slow, evenly-centered vibrato is used and in which phrases are molded with sureness and without affectation. In short, it is a style perfectly suited to this music. Bernstein's orchestral support is impeccable. There is resonant, full recorded sound in mono and stereo; and, in the stereo version, the violin is firmly centered, without the annoying spread it so often has.

ROBERT DAY FOR CU



"What *are* 'All the trimmings'?"

MOVIES

CU makes no movie selections; it simply reports the summarized results of a continuing poll of readers, along with a consensus of critics' reviews. Pictures are rated as Excellent (**E**), Good (**G**), Fair (**F**), or Poor (**P**). Where opinion was divided, the first letter reflects the main vote.

SCORED EXCELLENT OR GOOD BY CRITICS AND BY 85% OR MORE OF CU'S REPORTING READERS

PICTURE	CU	Cr
CAT BALLOU—J. Fonda, L. Marvin	GE	G
CHINA! Documentary by F. Greene	GE	GE
THE COLLECTOR—S. Eggar, T. Stamp	GE	GE
DARLING—J. Christie, D. Bogarde	EG	GE
THE FASCIST (Ital.)—U. Tognazzi, G. Wilson	GE	GE
GREAT RACE—N. Wood, J. Lemmon	EG	GE
HIGH INFIDELITY (Ital.)—C. Bloom, C. Aznavour	G	G
IL SUCCESSO (Ital.)—A. Aimee, V. Gassman	G	G
IN HARM'S WAY—P. Neal, J. Wayne	G	G
IPCRESS FILE—M. Caine, N. Green	GE	G
KNACK . . . AND HOW TO GET IT	GE	G
LA TIA TULA (Spanish)—A. Bautista	G	G
LIFE UPSIDE DOWN (Fr.)—C. Denner	GE	G
MOMENT OF TRUTH (Ital.)—M. M. Miguelin	G	G
MY FAIR LADY—A. Hepburn, R. Harrison	EG	E
NOBODY WAVED GOODBYE—P. Kastner	GE	GE
THE OVERCOAT (Russian)—R. Bykov	EG	GE
THE PAWNBROKER—R. Steiger, J. Sanchez	EG	E
RAPTURE—P. Gozzi, M. Douglas	G	G
ROTTEN TO THE CORE—A. Rodgers	G	G
SALLAH (Hebrew)—G. Noni, H. Topol	G	G
SHENANDOAH—J. Stewart, D. McClure	GE	G
SHIP OF FOOLS—S. Signoret, O. Werner	GE	GE
SOUND OF MUSIC—J. Andrews, C. Plummer	EG	GE
THOSE MAG. MEN IN THEIR FLY. MACHINES	GE	GE
THE TRAIN—B. Lancaster, P. Scofield	GE	GE
VON RYAN'S EXPRESS—F. Sinatra	GE	G

READERS' AND CRITICS' RATINGS OF OTHER PICTURES

PICTURE	CU	Cr
ACROSS THE RIVER—L. Gilbert	FG	FG
AGENT 8¾—S. Koscina, D. Bogarde	FG	FG
AMOROUS ADV. OF MOLL FLANDERS	FG	FG
APACHE GOLD—L. Barker, P. Brice		PF
ARIZONA RAIDERS—A. Murphy		FG
ART OF LOVE—J. Garner, D. Van Dyke	GF	FG
BACKFIRE (Fr.)—J. Seberg, J.-P. Belmondo	GF	FG
BAMBOLE (Ital.)—V. Lisi, N. Manfredi	FG	FG
BATTLE OF VILLA FIORITA—R. Brazzi	FG	FG
BEACH BLANKET BINGO—F. Avalon	F	F
BILLIE—P. Duke, J. Backus	FG	F
BLACK SPURS—L. Darnell, R. Calhoun	FP	F
BLOOD AND BLACK LACE—C. Mitchell	PF	P
BOUNTY KILLER—D. Duryea, R. Cameron		F
BRAINSTORM—A. Francis, J. Hunter	FG	FG
BUS RILEY'S BACK IN TOWN—Ann-Margret	GF	FG
CASANOVA '70 (Ital.)—M. Mastroianni	G	FG
CHRONICLE OF A SUMMER (Fr)		FG
CLARENCE, THE CROSS-EYED LION	FG	FG
CIRCLE OF LOVE—J. Fonda, M. Ronet	FG	F
CONVICT STAGE—H. Lauter, D. Barry		P
CRAZY PARADISE (Danish)—D. Passer	FG	F
CURSE OF THE FLY—B. Donlevy, G. Baker	PF	P
CURSE OF THE MUMMY'S TOMB—T. Morgan	FP	PF
CURSE OF THE STONE HAND—J. Carradine		P
DARK INTRUDER—J. Meredith, L. Nielsen	F	F
DAY THE EARTH FROZE—J. Powers		F
DEADWOOD '76—A. Hall, Jr., J. Lester		PF
DEVILS OF DARKNESS—W. Sylvester		F
DIARY OF A CHAMBERMAID (Fr.)	FG	FG
DIE! DIE! MY DARLING!—T. Bankhead	FG	F
DINGAKA—J. Prowse, S. Baker	F	F
DR. TERROR'S HOUSE OF HORRORS	FG	F
ECCO—Doc. narrated by G. Sanders		F
EVA—J. Moreau, S. Baker	F	F
EYE OF THE NEEDLE (Ital.)—V. Gassman		FG
FAMILY JEWELS—J. Lewis, D. Butterworth	F	F
FANNY HILL—L. Roman, M. Hopkins	FP	P
FINGER ON THE TRIGGER—R. Calhoun		F
FLUFFY—S. Jones, T. Randall	FG	FG
FOOL KILLER—A. Perkins, E. Albert	FG	FG
FORT COURAGEOUS—F. Beir, D. Barry	F	F
GENGHIS KHAN—S. Boyd, J. Mason	FG	F
GIRL HAPPY—E. Presley, S. Fabares	GF	FG
GIRLS ON THE BEACH—L. Gore	PF	P
GLORY GUYS—T. Tryon, H. Presnell	GF	G
GO GO MANIA—The Beatles, etc.	FP	F
GREAT SIOUX MASSACRE—J Cotten		FG
GREED IN THE SUN (Fr.)—J.-P. Belmondo		F
GUNFIGHTERS OF CASA GRANDE	PF	PF
GUNMEN OF THE RIO GRANDE—G. Madison		F
HALLELUJAH TRAIL—L. Remick, B. Lancaster	GF	FG
HARLOW—C. Lynley, E. Zimbalist, Jr.	PF	PF
HARLOW—C. Baker, M. Balsam	GF	FG
HARVEY MIDDLEMAN, FIREMAN	GF	G
HAVING WILD WEEKEND—Dave Clark Five	F	F
HELP!—The Beatles	G	FG
HERCULES AGAINST THE MOON MEN		PF
HERCULES, SAMSON & ULYSSES—K. Morris	P	P
HIGH WIND IN JAMAICA—A. Quinn	GF	FG
HORROR CASTLE—R. Podesta, C. Lee	F	PF
HOURS OF LOVE (Ital.)—U. Tognazzi		FG
HOW TO STUFF A WILD BIKINI	FP	F
HUMAN DUPLICATORS—G. Nader	F	F
HYSTERIA—L. Goldoni, R. Webber	F	F
I SAW WHAT YOU DID—J. Crawford	FG	FG
I'LL TAKE SWEDEN—B. Hope, T. Weld	F	F
IMAGE OF LOVE—Nar. by A. Newley		FG
INDIAN PAINT—J. Crawford, J. Silverheels		FG
INVASION 1700—J. Crain, J. Barrymore, Jr.	F	F
JIG SAW—J. Warner, R. Lewis		F
JOY IN THE MORNING—R. Chamberlain	FG	F
KIMBERLY JIM—M. Usher, J. Reeves	F	F
KWAHERI—Jungle documentary		FG
LAUREL AND HARDY'S LAUGHING '20s	G	G
LORD JIM—P. O'Toole, J. Mason	G	FG
LOVE AND KISSES—K. Nelson, R. Nelson		FG
LOVE GODDESSES—Film clips	G	G
LOVE—THE ITALIAN WAY—E. Sommer	F	F
McHALE'S NAVY JOINS THE AIR FORCE	FG	F
MAD EXECUTIONERS—M. Perschy, H. Felmy		F
MAGNIFICENT CUCKOLD (Ital.)—C. Cardinale	FG	FG
MAJOR DUNDEE—C. Heston, R. Harris	GF	FG
MALE HUNT (Fr.)—J.-P. Belmondo	G	FG
MARA OF THE WILDERNESS—L. Saunders	F	F
MARRIAGE ON THE ROCKS—F. Sinatra	FG	FG
MARRIED WOMAN (Fr.)—M. Meril, B. Noel	FG	FG
MASQUERADE—M. Mell, C. Robertson	GF	G
MIRAGE—D. Baker, G. Peck	G	FG
MISTER MOSES—C. Baker, R. Mitchum	GF	FG
MONKEY'S UNCLE—A. Funicello, T. Kirk	FG	F
MURIETA—J. Hunter, A. Kennedy		F
MUTINY IN OUTER SPACE—W. Leslie	FP	P
MY BABY IS BLACK—F. Giret, G. Heath	FP	F
MY BLOOD RUNS COLD—T. Donahue	FP	PF
NAKED BRIGADE—S. Eaton, K. Scott	FP	F
NAVAJO RUN—J. Seven, W. Kemmerling	FG	F
NEW ANGELS (Ital.)—Dir. U. Gregoretti		F
NONE BUT THE BRAVE—F. Sinatra	GF	FG
NOT ON YOUR LIFE (Spanish)—N. Manfredi	G	G
NURSE ON WHEELS—J. Mills, R. Lewis	FP	PF
ONCE A THIEF—Ann-Margret, A. Delon	GF	FG
OPERATION C.I.A.—B. Reynolds, D. Aubry		PF
OPERATION CROSSBOW—G. Peppard	G	G
OVER THERE 1914-1918—Documentary	GF	G
PARIS SECRET—Documentary		F
PARTY GIRL FOR THE CANDIDATE	P	P
REQUIEM FOR A GUNFIGHTER—R. Cameron		FG
REVENGE OF THE GLADIATORS—R. Browne	FP	P
THE REWARD—Y. Mimieux, M. von Sydow		F
SABOTEUR, CODE NAME—MORITURI	GF	G
SANDOKAN THE GREAT—S. Reeves	F	F
THE SANDPIPER—E. Taylor, R. Burton	GF	FG
SATAN BUG—A. Francis, G. Maharis	GF	FG
SEASIDE SWINGERS—J. Leyton, M. Sarne		F
SECRET OF BLOOD ISLAND—J. Hedley		F
SERGEANT DEADHEAD—F. Avalon	F	F
SEVEN SLAVES AGAINST THE WORLD	F	F
SHE—U. Andress, P. Cushing	F	FG
SKI PARTY—F. Avalon, D. Hickman	FP	F
THE SKULL—P. Cushing, C. Lee		P
SONS OF KATIE ELDER—J. Wayne	GF	FG
STRANGER KNOCKS (Danish)—P. L. Rye	FG	FG
SWINGERS' PARADISE—S. Hampshire	PF	F
SWINGIN' SUMMER—Q. O'Hara		P
SWORD OF ALI BABA—J. Lane, P. Mann	FP	P
SYMPHONY FOR A MASSACRE (Fr.)	FG	FG
SYNANON—S. Stevens, C. Connors	G	G
TABOOS OF THE WORLD—Documentary	PF	P
TAXI FOR TOBRUK (Fr.)—C. Aznavour	GF	G
THAT FUNNY FEELING—S. Dee, B. Darin	G	FG
THESE ARE THE DAMNED—M. Carey	F	FG
THIRD DAY—F. Ashley, G. Peppard	FG	FG
THRILL KILLERS—L. Renay, C. Flagg		P
TICKLE ME—E. Presley, J. Adams	FG	F
TOWN TAMER—T. Moore, D. Andrews	FP	F
TRUTH ABOUT SPRING—H. Mills, J. Mills	GF	FG
TWO LIVING, ONE DEAD—B. Travers	FG	FG
UP FROM THE BEACH—C. Robertson	F	FG
VERY SPECIAL FAVOR—L. Caron, R. Hudson	FG	FG
WAR GODS OF THE DEEP—V. Price	FP	PF
WAR OF THE ZOMBIES—J. Barrymore, Jr.	P	P
WAR PARTY—M. T. Mikler, D. Davison	PF	PF
WHAT'S NEW PUSSYCAT?—P. Sellers	FG	F
WHITE VOICES (Ital.)—S. Milo, P. Ferrari	FG	FG
WILD ON THE BEACH—F. Randall	P	P
WILD SEED—C. Kaye, M. Parks	G	FG
WOMAN WHO WOULDN'T DIE—J. Merrow	F	F
WORLD OF ABBOTT & COSTELLO	GF	G
YELLOW ROLLS-ROYCE—R. Harrison	G	G
YOUNG CASSIDY—R. Taylor, F. Robson	GF	G
YOUNG DILLINGER—N. Adams	FP	PF
ZEBRA IN THE KITCHEN—J. Meadows	FG	F

RETURNS AREN'T IN (BUT SCORED EXCELLENT OR GOOD BY CRITICS)

AGONY AND THE ECSTASY—C. Heston, R. Harrison
LITTLE ONES—K. Smith, C. Gonzales
LOVE IN 4 DIMENSIONS (Ital.-Fr)—S. Koscina
MICKEY ONE—W. Beatty, H. Hatfield
THE PLAYGROUND—R. Vaughn, E. Ryan
TO DIE IN MADRID—Commentary by J. Gielgud

CU would like to have as many readers as possible participate in its movie poll. If you attend the movies fairly regularly, and would like to take part, please write to Movie Reviews, Consumers Union, 256 Washington Street, Mt. Vernon, N.Y., 10550, asking for a supply of postage-paid rating cards.

LETTERS continued from the inside front cover

representatives. Therefore, CU should publish each year (perhaps in the Buying Guide) a list of all U.S. Senators and Representatives (and their districts) and the chairmen of committees. The list of chairmen is particularly important since, while it is relatively easy to determine who one's Senators and Representative are, finding out who chairs a committee may be quite difficult.

The list I am suggesting would make the individual consumer's task considerably easier and encourage his participation in Federal legislation.

WOBURN, MASS. W.G.R.

The Federal Government already publishes such lists. The most complete listing is the "Congressional Directory," which sells for $3 but is available for reference at almost any library. There is another book, the U.S. Senate's "Telephone Directory," which costs only 70¢ and lists both Senators and Representatives alphabetically (giving their states, though not their districts). It also gives the full membership of all Senate committees—standing, select, and special—plus the chairmen of these committees in the House as well as lists of staff personnel for each Senator and Senate committee. It doesn't list members of subcommittees, though, and many consumer hearings come before these smaller bodies. However, CU always includes in its reports on Congressional hearings the name of the chairman of the committee or subcommittee involved. The Senate's "Telephone Directory" (or the "Congressional Directory") can be ordered from the Government Printing Office, Washington, D. C. 20402.

Colorful deception

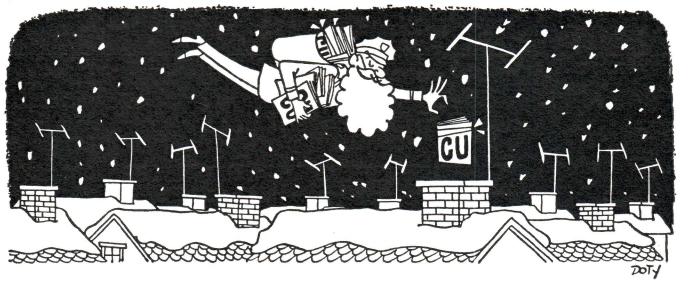
Dear CU: Your attention is called to what I consider a new type of deceptive packaging. The orange stripes in this grapefruit bag make the green grapefruit look golden ripe.

PHILADELPHIA, PA. J.P.O'N.

The transparent plastic bag enclosed with this letter had an all-over pinstripe pattern that might well have affected the apparent color of the fruit inside. This is not a new packaging gimmick at all. In fact, the U.S. Department of Agriculture for some years has had regulations outlawing certain red decorations on packages of bacon and some other packaged meats and is about to extend the ban to containers for frankfurters, sliced bologna, liverwurst, and the like. Also, the Federal Food, Drug and Cosmetic Act says it is illegal "if a

Continued on next page

CONSUMER REPORTS



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___**The Real Voice** by Richard Harris (paperbound edition for CU subscribers only, $1.50).

___**The Consumers Union Report on Smoking and the Public Interest** (paperbound; CU subscriber rate, $1; nonsubscriber rate, $1.50).

___**Health Guide for Travelers** (revised and enlarged paperbound 1964 edition, 50¢).

___**Movies For TV—4450 Ratings** (1947 through 1963; paperbound, 50¢).

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When You Move...

GIVE CU SIX WEEKS' NOTICE to be sure we have time to keep **Consumer Reports** coming to you without interruption. We start printing the labels for any one issue about a month before you will receive that issue; address changes not processed before your label has been printed must wait a full month before taking effect. To be sure your new address gets in promptly, please allow us the two additional weeks for processing.

YOU MUST SEND TWO ADDRESSES: 1) **your old address**—preferably the actual address label from the wrapper, otherwise a copy of all the information on the label, including code numbers; 2) **your new address,** including name, street, city, state, and—very important—zip code number. To make it possible for us to conform with Post Office mailing regulations, our file of subscribers' addresses is divided into geographical sections before being alphabetized; if you don't send the name **and** address from your old label, therefore, we cannot find your address stencil to make the change.

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LETTERS continued

container is so made, formed or filled as to be misleading." One FDA official told CU that he thought J.P.O.'N.'s package would come within this definition.

Rambler owners note

Dear CU: I enjoyed your article in the August 1965 issue, "How Effective are Dual Brakes?" I am the owner of a 1963 *Rambler* and can speak for the effectiveness of its dual brakes. The rear wheel brakes failed completely on my car during a semi-emergency stop from high speed on a freeway. However, the front wheels stopped the car with what I guess to be 50% effectiveness. The increased pedal travel definitely indicated the problem.

The brakes failed because the speedometer cable had been strapped across the brake line and wore into the line at 33,000 miles.

AIKEN, S.C. J.S.B.

These two lines are clipped together on later *Ramblers*, too. There should be no problem, CU's auto consultants say, unless the clip loosens; then the lines can rub together, and the friction might wear the brake line. *Rambler* owners would do well to have their service station check this clip during regular maintenance.

Curious protection

Dear CU: Since my experience indicates the need for more consumer alertness in the purchase of prescription drugs, on my last order I picked up the telephone and shopped for a variance of price. For the self-same item the prices quoted in my random calls were: $10, $9.70, $8.80, $7.90, $7.50, $6.50, and $6.30. Only one drugstore refused to give me a price. Its spokesman indicated that this refusal was for my "protection." That's one protection I could well do without.

SAGINAW, MICH. G.A.F.

Readers often report large differences in various stores' prices for prescription drugs. This seems to be one area where price shopping is really significant.

SOME RATINGS ELIMINATED

The six shades of *Clairol Loving Care* semipermanent hair colorings rated in CONSUMER REPORTS, July 1965, should not have been included in the project as conducted. The manufacturer justifiably points out that these products are not sold for general use in brightening the hair or blending uneven color—the basic functions for which CU tested the products. Claims for the *Loving Care* line are limited specifically to hiding gray. Since CU's Ratings were on a different basis, the ones for *Loving Care* are withdrawn.

CUMULATIVE INDEX

The index in this issue includes principal subjects covered in all of the 11 regular issues of CONSUMER REPORTS for 1965. The pocket-sized December Buying Guide Issue carries its own index. Sequences are as follows:

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